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THE
BRITISH JOURNAL
OF
DENTAL SCIENCE.

VOL. IV.
JANUARY—DECEMBER, 1861.

LONDON:
JOHN CHURCHILL, NEW BURLINGTON STREET.

British Journal of Dental Science.

No. 55.

LONDON, JANUARY, 1861.

VOL. IV.

Dental Surgery and Medicine.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

(From 'The Dental Cosmos,' October, 1860.)

(Continued from vol. iii, p. 486.)

DENTAL medication is general medication. Several years ago I said on the floor of this room, that it would be compulsory on the part of the professors of our dental colleges to suit the curriculum of their institutions to this growing requirement. I do not forget, gentlemen, the reception my doctrines then met with. We have grown somewhat in stature since then; we are growing rapidly now from month to month. I remarked at that time, that I could not understand how the aurist and oculist could be successful without the abilities of the general practitioner. And as I entertained a respect for the dentist equal to that of any special surgeon, I could not understand how he alone, of all the specialists, could hope for the greatest success, possessed of only a local knowledge or an ability to treat a cachexia only at the point or periphery at which a cause exhibited its effect. But the good dental graduate of to-day is almost as well qualified to practise medicine as dentistry; and, gentlemen, according to my views, he should be quite as able, and I have little doubt, judging of the future by the past, that he, after a time, will be as fully qualified. You, who are as familiar with private teaching, with clinics, and hospitals, as I am, must have been struck with the number of dental students constantly met with at such places. I am sure four fifths will be found so engaged in the hours not devoted to their own lectures. Does not

this suggest that we are not even yet giving them as much as they can digest? If we look at dental classes as in the winter they assemble in the colleges, and compare them with the classes of our medical schools, we will not have to ask ourselves the second time why they thus cry for more—it is indeed due to the growing intelligence of the profession. If, gentlemen, to-morrow I should have two students enter my office, one with the intention of reading medicine, and the other dentistry, the only difference I should make would be, that when each had finished the same medical studies I would conceive my dental student ready for the manipulative or mechanical department of his profession, while the first would be ready to go forth. Theory first, practice afterwards.

Neither should we consider their education finished, for as science advances so must the practice of a profession advance with it. At this very moment Europe is divided on Virchow's new doctrine of life as the result of cell segmentation. It would now seem as nonsense to talk of a blastema and the spontaneous evolution therefrom of cytoblasts. The embryo develops by the segmentation of a single cell; the alveoli, on the extraction of teeth, are filled up by the same process of segmentation. We hereafter have nothing to do with lymph as a reparative agent; we must cure our patients by exciting one of the three functions of a neighbouring part. We attribute dental caries to acidity, and heretofore we have been satisfied in considering the acidity as we find it in the mouth. We have not, as a class, asked ourselves the nature of these acids, or to what is their production due. We

have underrated our position in giving too wide a scope to the general practitioner, and limiting too much our own. When, years back, before this association I have spoken of anæmia, chlorosis, and kindred conditions as the source of dental caries, I have been met with rebuke for travelling outside my profession. Let me now, gentlemen, add my mite to the experience of to-night by affirming that I believe I have saved more teeth by constitutional treatment than ever I have through manipulation. And if I could exhibit to you my practice, I would offer it in proof of the assertion. I could point happily to many cases where, when the patients first came into my hands, the tendency to caries seemed a cachexia; and where, under treatment, this cachexia has seemed to wear out, as does fire when unsupplied with fuel. I have the satisfaction of saying I could show you many such cases. And why not? Has not every one of us seen sets of teeth perfect up to some certain date, an attack of fever perhaps, or pregnancy, and then, under a constitutional change, at once succumb? Has not every one of us met with sets of teeth where our art seemed set at defiance? I know I may answer for all in the affirmative.

If, then, I am asked what these constitutional deteriorations are, I can only answer by referring you to the physiology of animal life, and to conditions modifying physiological action, or perverting such action to the pathological. Thus, I may allude to the circulation of the nutritive or life-supporting force, and may pronounce such circulation physiological when an equilibrium is preserved, both as concerns the relative quantities and qualities of constituent particles and *pro rata* distribution. Thus recognising this normal condition of blood and its office, I acknowledge a pathological condition in what Dr. Wood describes as inflammation, "a perverted condition of the circulation of a part, attended with heat, redness, pain, swelling, and a modification of secretion and nutrition." If I would make an analysis of its constituents, I may discover a deficiency in red corpuscles by looking in the face of my patient; I may see deficiency in or excess of fibrin, by watching the clotting blood; I may notice deficiency or excess of water as the blood flows from the cavity of an extracted tooth; I may note the excess of albumen in my strumous patient, not critically, of course, but to the practical advantage of my cases; patho-

logical conditions may be induced from the fluids to the solids, or, firstly attacking the solids, may thus indirectly affect the fluids. Thus, in the one case we have dental caries as the result of a constitutional deterioration of the muco-oral secretions. And, to get an example from our peculiar domain, we have dyspepsia and its train of evil associations as a result of dental caries.

Mucus is the secretion, as we know, of numberless glands distributed through the alimentary canal. In health mucus may be denominated neutral, its capacity for deterioration may be marked by noticing the difference between the pearly and watery character of that which is eliminated by the healthy follicle and the sordes of the febrile condition. Deteriorated mucus is always more or less acid in its reaction. The effect of this acid mucus on the teeth is evident to all those who are familiar with the matter through clinical experience, or general practice. I have nothing to say of it as an entirely local condition, but shall briefly refer to it as a constitutional condition. In various of the exanthemata, in bilious remittent, in all typhoid forms of fever, the production of this watery deficient mucus gives us the sordes of the books. As I remarked, it is in itself most eroding, but there is from it an indirect effect in the formation in the mouth, through its presence, of nitric acid. You ask me to explain the manner of this production. Sordes is an organic body, having the nitrogenous element in excess; in its decomposition, which is going on so long as it continues to be produced, it liberates its nitrogen; this in turn indirectly combines with its equivalent of oxygen, yielding nitric acid as the result. Yet, if objections are urged, considering the known difficulties in the way of this union, we have only to convince ourselves, to take a portion of the sordes and fluid of a febrile mouth, and subject it, after neutralizing it by potash, to either of the tests given by Taylor in his 'Toxicology', particularly the last one, as found on page 188 of his work. You will recall the mention made by Professor Harris, in which Dr. S. R. Mitchell gets nitrous acid from the decomposing nitrogenous substance found between the teeth.

(To be continued.)

ERRORS RESPECTING DENTITION. By Dr. JACOBI.

(From the *American Medical Times and Gazette*,
Dec. 29, 1860.)

INTRODUCTORY to his Lectures on "Dentition and its Derangements," Dr. Jacobi makes the following observations:

"You know that, among the public at large, even among the educated portion of the community, teething is regarded as one of the two scape-goats of all diseases of infantile age. Teething and worms are among matters acknowledged as the universal and all-powerful sources of disease. Whenever an innocent ascaris or puny oxyasis is observed in the fæces of a child, worms are, for years to come, considered as the undoubted cause of any disease that may occur. Teething, a normal, physiological development, taking place at an age which, for many reasons, is subject to a large number of diseases, has a strong hold on frightened maternal minds. The first dentition generally occupies the first two years of infantile life, a period in which the child is peculiarly liable to diseases both numerous and frequently dangerous. As the protrusion of a tooth (and, on the average, a tooth will cut every month) is a remarkable phenomenon, and is something new and visible, it is believed to be the cause of every unfavorable occurrence in early life. A mother will bring to you her child, thin, emaciated, and anæmic, with sunken eyes and the wrinkled physiognomy of old age, and tell you that she is well aware the poor thing is suffering from teething, and that, therefore, nothing can be done to alleviate its sufferings. She will never be convinced that the child is dying from her own neglect; but she has allowed a slight catarrh of the intestines, perhaps, to degenerate into incurable follicular ulceration. . . . Teething is thus considered the most efficient cause of most of the terrible diseases which prove fatal to thousands of the rising generation. I can assure you that the readiness to attribute all the diseases of infantile life to teething has destroyed more human beings than many of the wars described in history. For, though parents are so much impressed with the belief of the dangers of teething, still they never think of attempting to save the lives of their children by counteracting the supposed life-endangering power of a normal process.

"What is now the belief of the public has been the conviction of the medical world through centuries down to the present time. General experience shows that the persuasion of the scientific world, after having been given up to make room for more correct opinions, has remained in the public at large, and it is to be feared that it will not soon be removed. And it would be fortunate if the prejudice were confined to the public. But, unfortunately, it still lingers in the medical profession, and it is for this reason that I have dwelt upon it thus lengthily. Nothing is more common than to hear doctors, young and old, in cases of infantile disease, diagnosticate 'teething' after mother and nurse have done so before; and nothing is more frequent than to be told that the death of a child was the consequence of dentition. I have seen in this city (New York) a certificate of death in which the direct cause of the death of a child five years of age, with his jaws full of teeth, was stated to be 'teething.' Consider for a moment the absurdity of the conclusion, that a normal physiological process is fatal to the existence of a living being! Who has ever ventured to assert that menstruation, pregnancy, or the climacteric years are the direct causes of death? It is equally absurd to assert it of dentition; and yet such statements are daily made by physicians. According to the census of England for 1857, there were in the United Kingdom (England alone) 3992 deaths from teething, 3791 of which occurred in children of less than two years, and 201 in children from two to five. Between 1845 and 1850, no less than 8466 infants are reported to have died in London from teething, and the disorders caused by the general irritation attending dentition—the number of deaths from all causes being 258,271, giving the proportion of 1 death from teething to 74 from all causes. In the State of New York there died 626 children from teething in 1855; but it is not stated whether a part of these unfortunate children had not the full contingent of teeth of the first dentition."

After adverting to the graver symptoms sometimes met with during dentition, Dr. Jacobi continues:—"In a certain number vomiting will stop, but the diarrhoea continues. The deluded mother, who felt a little uneasy at the severe character which teething seemed to have assumed, is gratified, after the main symptoms have passed by, to find that her child is suffering from diarrhoea only, and that, in this manner,

teething will be made easy and comfortable. But, alas! this deception on the part of the mother is too often fatal to the child. The diarrhoea is allowed to go on for days and weary weeks; the digestion becomes hopelessly destroyed, the abdomen immensely distended with gas, the mesenteric glands swollen and impermeable to chyme, the catarrh and over-secretion of the glandular follicles of the intestine lead to deep ulcerations of the intestinal canal, the diarrhoea becomes also more frequent, serous, mucous, or bloody, the arms and legs of the little sufferer dwindle away, and the countenance becomes emaciated and senile. The scene closes with a consoling certificate from some doctor or druggist, affirming that teething was the cause of death. Thus 'millions' of infants are destroyed by ignorant, prejudiced, and incorrigible advisers. I say incorrigible. I know that mothers will always consult their prejudices first, the prejudices of their neighbours next, perhaps, at some later time, common sense, and finally they may seek the advice of an educated medical man. I know that a mother who has consigned a beloved child to the grave will repeat the follies which cost her the child she has lost. If you remonstrate with her for neglecting the second as she did the first, she will reply, Was not the child teething? would you prevent it teething naturally? Was it her fault that the child got teeth with difficulty? The true inference would be that nature neglected much, and that it was greatly at fault in the matter of dentition. I once read a newspaper announcement of the death of a child, in which the parents affirmed that 'the Lord had hauled the dear child up to heaven by the teeth.' Now, in this case, neither the father nor the mother was at fault."

ON RISODONTROPHY.

To the Editor of the 'British Journal of Dental Science.'

SIR,—The letter of Mr. Belisario, treating the subject of risodontrophy, which was read before the Odontological Society on November 5th, and the discussion which ensued thereon, are full of interest to the profession. Cases must frequently occur to every practitioner where, when the front and especially the lateral incisors are to be filled, and the nerve is or becomes exposed, he has,

I think, to decide which of the six following modes of treatment he must pursue. He must either endeavour to cap the nerve; or to build the gold so as to arch the nerve, as suggested by the late lamented Dr. Chapin Harris; or he may direct his patient to keep a pledget of cotton, steeped in spirits, until the nerve has sloughed away; or destroy it with some of the caustics, such as arsenic; or he may cut out the nerve to the very end of the root; or he may have recourse to risodontrophy. It is very desirable that this subject should be well discussed by the profession, so that we might learn which treatment is best to follow, especially with incisors.

I think, all the different ways I have enumerated present some objections, but of all I believe that risodontrophy has the fewest. Capping the nerve is an uncertain operation. If it does not succeed, the nerve generally suppurates, and an offensive discharge takes place, which strongly suggests a great fear for the eventual healthy state of the peridental membrane. In shallow cavities, where to cap the nerve would fill up so much space, and allow no hold for the gold, Dr. Harris suggested that the gold might be packed in such a manner as to slightly arch the nerve, and that the gold might be condensed laterally instead of by direct pressure. I do not know whether many have tried this. It requires great skill to pack densely and successfully under such circumstances; and I do not remember a case in which I felt satisfied that the filling would hold any length of time, when I tried it. The objections to letting the patient go for months with a pledget of cotton steeped in some spirituous preparation are, I think, great. The patient often does not return until a much longer period of time has elapsed than was contemplated. Decay has probably in the meantime thinned the walls of the cavity, so as to entail the necessity of cutting the weak edges so much as to make the tooth ugly; or by having forced larger and larger pieces of cotton between the teeth, he may have separated them in such a manner as to make them appear unsightly.

The objection to the use of arsenic is, that discoloration may take place. This danger, in an incisor especially, may be diminished very much by filling up to the apex of the root; but there still remains a risk for the peridental membrane, and also a liability to tenderness for a long period, and perhaps permanently, in the root, when touched or pressed.

To cut out the nerve to the very end of the root is, with some exceptional cases, such a very painful operation, that many would rather lose a dozen teeth than undergo it.

The great objection to risodontrophy is, first, the sharp pain experienced when the nerve is reached; and, secondly, the frequent presence of a slight tenderness in the gum for some days after.

In the discussion on the subject, on November 5th, some gentlemen present spoke of a fear that they had that decay might occur in the perforation itself. I believe that this objection can be completely put aside by the operation being performed as Dr. Hüllihen recommended, namely, that the drill should be made to enter through the gum, a few lines from its free edge; and thus, when it heals, it prevents anything, even the saliva, entering the aperture, and guarantees it from decay. A description of the method he proposed is to be found in 'The American Journal of Dental Science,' vol. iii, page 160, new series.

I have always pursued this plan for the six anterior teeth; and excepting a slight tenderness in some few cases, which lasted some days occasionally, I have no recollection of any unpleasant consequences ensuing. I have practised it, I think, in every instance where the nerve has been exposed in the

incisors and under bicuspsids, unless the patient were so delicate in health as to make it undesirable that such a nervous shock should be given. In teeth where there were two or three roots, I have not practised it for some years.

I am careful to begin the operation with a spear-pointed drill, but only until I am satisfied that I am in the right direction for the nerve-cavity; and then I take a square-headed one, rather larger than I suppose the breadth of the nerve to be, and this I work into the nerve-cavity; and when I feel that it has entered, I rotate it as quickly and as thoroughly as I possibly can, and never leave off till my patient tells me that he has no more pain, when I conclude that the nerve has been completely divided.

I think that the question whether the nerve calcifies, or sloughs away, or remains living after the operation, is full of interest. Never having had an opportunity of examining a tooth when it was extracted, which had been so treated, I confess that I had the idea that, generally speaking, the large portion of the nerve which had been left in the root retained its vitality, and was useful in preserving the tooth in a healthy state.

CHARLES WILLIAM DUNK.

4245, Piazza Sta. Maria Novella,
Florence, Italy; Dec. 17th, 1880.

Mechanical Dentistry.

OBSERVATIONS ON MECHANICAL DENTISTRY.

By LAWRENCE VANDERPANT.

THERE are few men, as a class, who have shewn a greater partiality for secrets than dentists. I speak in the past tense; for, thanks to the influence of your admirably conducted journal, a great many prejudices have been removed from the dental mind, and a better feeling generally exists. But within, I may say, a very few months, a workroom secret was a thing as jealously guarded as the gold-box itself. Even now, a great disinclination exists to impart information connected with the laboratory. With the view of inducing others, more

qualified than myself, to contribute, I beg to offer you the following observations.

In my letter, last month, I considered difficulties that occurred in the vulcanite process, after having obtained perfect models and bite. I now desire to suggest a means of obtaining the one and the other.

There is no one that will for a moment dispute the imperative necessity of obtaining (in the case of an entire set more particularly) a perfect bite. It was comparatively an easy matter, with a bone lower and gold upper, or metal in both jaws, to obtain a most perfect articulation; but by any accident *should* there be an error, it was not a great difficulty to remedy; but in the vulcanite it becomes an

impossibility. I maintain that it is impossible to obtain a reliable guide by the very common method adopted, especially by itinerant practitioners, of placing a large piece of wax in the patients' mouth and desiring them to "bite." Possibly I and my friends may be more awkward than others, but I can only say that nearly every set of teeth, in which I have taken the bite on the system I condemn, has been more or less unsatisfactory. The system I adopt is the following:—Having hardened my plaster models, I cut out a piece of lead, in thickness equal to about Ash's 10-gauge, and work up with a pair of pliers a plate sufficiently accurate a fit to be steady in the mouth (a species of bone-burnisher I find convenient to press it on to the model); on these plates I mount wax blocks (in the lower hard wax), applying the swivels and springs as if they were bone, having adjusted in the mouth the height, &c.; I then secure the two upper and lower incisors, by means of the hard wax (about equal parts of wax and rosin); so that you not only give an unerring guide to your assistant, but allow your patient to form a correct idea of the

alteration you will make in the contour of the features.

I find it a matter of considerable difficulty to obtain from a plaster model a duplicate in every way perfect; not in the most simple cases am I satisfied that a perfect model is the result of a wax impression taken from the original. I have, within the last few days, adopted a plan with which I have obtained better results; it is the following:—previous to casting the model, I carefully paint the wax with oil, and remove the wax when the plaster has become sufficiently set, thus: allow the model, wax, and tray, to remain in hot water for about five minutes, plunge them from that into cold for about half a minute; you then carefully disunite them, and the wax will be found in most cases almost as perfect as it came from the mouth; the effect of the cold water is to cause the wax to adhere to the tray.

Although nine tenths of your readers, I dare say, already practise what I suggest, yet I venture to hope I may be the means of stimulating others to offer remarks on mechanical subjects.

52, Maddox Street, Bond Street.

Chemical Department.

PRACTICAL HINTS ON ELECTRICITY IN RELATION TO ELECTRO-PHYSIOLOGICAL APPARATUS. By J. N. HEARDER, Electrician, Plymouth.

(Continued from vol. iii, p. 488.)

ELECTRICAL CONDUCTIVITY IN RELATION TO THERMAL EFFECTS.

It is generally acknowledged amongst electricians that the term conduction, as applied to metals, implies negative rather than positive qualities; that is to say, all conductors afford a certain amount of resistance, but those are considered the best which afford the least. Upon this hypothesis, increased transverse sectional area in the same metal diminishes resistance by allowing the transmission of a larger quantity in a given time. The practical determination of the relative conducting capabilities of different metals, or of different samples of the same metal, has gene-

rally been accomplished by the comparison of galvano-metric or electro-magnetic effects; but I am not aware of any course of experiments which have been undertaken with a view to trace any connexion, or institute any comparison, between the thermal effects of the voltaic current on metals and their conducting powers as thus indicated, or to work out any scale of the conducting powers of metals, based simply upon the thermal effects of the voltaic current upon them.

In 1826, Sir W. S. Harris communicated to the Royal Society the result of a series of experiments with his thermoelectrometer for determining the relative conducting power of metals for the Leyden discharge. His experiments were based upon the assumption that metals are heated by equal discharges of electricity through them, from an electrical jar or battery, in proportion to the resistance which they offer to its passage;

hence their

relative conducting powers in the scale were considered to be inversely as their thermometric indications. Thus in passing a carefully measured shock through wires of various metals, all of precisely the same diameter and length, stretched through the bulb of an air-thermometer, the relative degrees of heat indicated upon the scale are shown in the following Table, extracted from the 'Philosophical Transactions' of 1827 :

Metals.	Effects.
Copper	6
Silver	6
Gold	9
Zinc	18
Platinum	30
Iron	30
Tin	36
Lead	72
Brass	18

In the year 1827 I thought of using this thermo-electrometer for determining the relative conducting powers of metals for voltaic electricity, and was pleased, on applying a single pair of plates to it for the first time, to find its indications extremely regular, the fluid rising constantly to the same point at each successive contact, and remaining almost permanent as long as contact was maintained. The instrument, however, appeared to require some few modifications to adapt it more particularly to voltaic purposes; and after various trials I adopted the form which I have described in the 'Philosophical Magazine' for May, 1857. The metals were all drawn into wires of the same size, and the same lengths were used in each experiment.

The voltaic batteries which I used were formed upon the principle of Dr. Hare's calorimotor and coil batteries. One modification consisted of a plate of zinc six inches wide and six feet in length, coiled with a similar plate of copper between its convolutions so as to maintain a space of half an inch between the copper and zinc, the last coil of copper being made entirely to enclose the end of the zinc, so that the copper plate was about six inches longer than the zinc. Both surfaces of each metal were thus opposed to the action of the others. A second form consisted of a similar area of zinc and copper cut into plates of six inches square, and fastened alternately in grooves in a wooden frame at a distance of half an inch from each other, the two end plates being copper. All the zinc plates were united on one side, and all the copper plates on the

other, thus forming a single pair equal in surface, and, as ascertained by experiment, equal in effect to the coil just described. These batteries were suspended over a wooden trough by counterbalancing weights, which admitted of their being immersed either wholly or to any depth in the acid.

The exciting fluid consisted, by measure, of sulphuric acid, 1 part, nitric acid, 1 part, and water 120. Stout flexible wires proceeded from the battery to the thermo-electrometer, and the battery was plunged in the acid at each experiment and raised again as soon as it was concluded.

In my first series of experiments I was met by the curious fact, that the order in which the metals were heated by the voltaic arrangements which I employed was the reverse of that which took place with the Leyden discharge; that is to say, the best conductors were the most heated, and the worst the least, as will be seen by the following Table, in which the length of wire employed in each experiment was 8.5 inches, and its size about No. 26 wire-gauge. The numbers given are the mean of six experiments, the variation in them not exceeding more than two or three degrees :

Metal employed in thermo-electrometer.	Degrees of heat on scale of thermo-electrometer.
Silver	81
Copper	70
Zinc	47
Brass	43
Gold	41
Platinum	41
Tin	39
Iron	35
Lead	26

These experiments were repeated at different times with the same wires and with the same relative results.

Since the best conductors were the most heated in these experiments, it seemed to follow that, with any single metal, larger wires would be heated more than small ones; and this I found to be the case up to the largest size that could be inserted into the electrometer, viz., No. 15 wire-gauge. I regret that a scale of these results with copper wires from No. 15 to No. 36 has been lost, but it showed a curious coincidence between the temperature and the mass of metal. This remarkable inversion of their relative order as compared with the results obtained by the Leyden discharge, whilst it showed a consistency with itself which left no room to

attribute it to any error in manipulation, yet seemed to exhibit such an inconsistency with preconceived notions of the laws of electrical conduction, that I was induced to vary the experiments in the following manner.

Instead of introducing the several metallic wires in succession into the bulb of the thermo-electrometer, I used them externally, causing them to form part of the circuit between it and the battery, and employing in the electrometer simply a copper wire much stouter than those under examination. The following table gives the results, the same wires being used as before:

Wires in circuit between battery and thermometer.	Degrees on thermometer.
Silver	142
Copper	128
Zinc	93
Brass	92
Gold	70
Tin	61
Platinum	60
Iron	55
Lead	33

Note.—The battery being applied to the electrometer without any of the wires in circuit, the fluid in the stem rose to 176°.

These experiments were repeated at various intervals with wires made indiscriminately from such samples as were at hand, though not with any idea of testing variations in the conducting power of different samples of the same metal; hence the relation between the order of the results was not always the same, as will be seen by the following set of experiments, in which a different set of wires were employed:

TABLE I.

Wires in the bulb of the thermometer.	Degrees indicated on the scale.
Copper	180
Zinc	156
Brass	155
Platinum	128
Tin	126
Iron	110
Lead	104

TABLE II.

Wires introduced into the circuit.	Degrees on thermo-electrometer containing copper wire.
Circuit completed without wire	150
Copper	128
Zinc	93
Brass	92
Tin	61
Platinum	60
Iron	55
Lead	33

The discrepancy in these results, though perplexing at the time, is now easily accounted for, when it is considered that even samples of copper wire vary as much in their conducting power as 50 to 120.

On employing two electrometers in consecutive circuit, in one of which was inserted a stout copper wire, and in the other the various metals in succession, it was curious to observe the fluid stand highest in both when the best conductors were used, and lowest with the worst; whilst on employing a similar arrangement for transmitting the charge of an electrical battery the order was reversed, each electrometer giving the highest when the other gave the lowest results.

Whilst experimenting on one occasion with the various wires externally to the electrometer, I had the curiosity to bring my finger in contact with the wire to ascertain its temperature. I remarked that every time I touched it the fluid in the electrometer rose, indicating an increase of temperature, and implying also an increase of conducting power in the metal thus touched. I found that this was owing to a reduction of its temperature; for on subsequently moistening it with ether, water, &c., or by blowing upon it, the fluid rose in the electrometer as the temperature was reduced, whilst the application of a spirit-lamp to increase the temperature of the wire produced a corresponding fall in the thermometer. Two electrometers were subsequently employed in circuit, the same current passing consecutively through them. To one of the electrometers a second battery was applied. The result was an increase of temperature of the included wire; and I discovered that, by raising or lowering the second battery so as to gradually increase or diminish the temperature of one of the wires, the fluid as it rose and fell in that electrometer gave rise to a reverse motion of the fluid in the other, so that as one rose the other fell, and *vice versâ*.

Although these experiments were made more than thirty years since, I am induced to believe that they may still appear novel to some, since, in a conversation a short time since with one of the first electricians of the day, he would scarcely credit them, alleging that they were contrary to all our experience; they must, however, be taken as indicating only the results due to the peculiar arrangements and conditions herein described.

(To be continued.)

Hospital Reports and Case-Book.

FIBROUS TUMOUR OF THE LEFT SUPERIOR MAXILLA, INVOLVING THE ANTRUM, OF FIFTEEN YEARS' GROWTH; SUCCESSFUL REMOVAL.

(Under the care of Mr. FERGUSSON.)

(From 'The Lancet,' January 5th, 1861.)

DISEASES of the jaws rank amongst the most important in surgery, and require much diagnostic tact, and much skill and patient attention, to treat. The truth of this remark is fully borne out by the valuable series of cases which we have brought together on the present occasion. Their number and length preclude our doing more than very briefly to refer to them generally. Of the seven cases, the upper jaw was affected in four, and the lower in three. In two the disease was malignant—namely, Mr. Skey's and Mr. Adams' cases; and, for the present, the latter has made a most excellent and, we may say, remarkable recovery. In the former the operation was a partial one, and the man has, no doubt, succumbed since his departure from the hospital. Of the other cases, all proved successful excepting that of the coloured patient upon whom Mr. Fergusson operated. The fatal result was brought about by the exhaustion consequent upon the debilitating effects of a very severe and destructive attack of purulent ophthalmia. We would draw attention to the form of incision adopted by Mr. Fergusson, which wholly obviates the risk of any subsequent deformity. We have seen him practise this many times; and, beyond the faint cicatrix at the side of the nose, it requires very close examination to detect that of the other parts of the incision, after the wound has been united for a short time. In four of the cases—three in the upper and one in the lower jaw—the nature of the morbid element was some one of the varieties of fibrous tissue. (Such also was the kind of tumour in Mr. Butcher's remarkable case of successful extirpation of the entire upper jaw in a boy of sixteen.)

All the patients were elderly, excepting Mr. Bowman's, aged twenty-seven, and Mr. Quain's, a girl of fifteen. It may be mentioned that chloroform was administered in all the cases; and we believe it is the general practice now to use this agent in operations on the jaws, although at one time it was considered to be a source of danger.

For the notes of the following three cases we are indebted to Mr. Charles S. Matthews, house-surgeon to the hospital.

G. C—, aged fifty-five, admitted May 30th, 1860, with a tumour of the left superior maxillary bone, which had first appeared fifteen years previous to his admission, about half an inch below the inner angle of the eye. This increased very slowly in size for about seven years, by which time it had only attained the dimensions of an almond. The growth was now removed by operation. From this time he suffered no pain or inconvenience from the part, and enjoyed good health until six months before admission, when the occurrence of shooting pains in the left cheek drew his attention to the part, and he discovered a small swelling in the situation of the disease which had been removed. This had gradually increased until the date of his admission, when it was found to involve the left superior maxillary and malar bones, and projecting slightly into the left nostril, somewhat impeding respiration through it. The tumour was hard to the touch, not very tender, and caused him comparatively little pain.

On June 2d, chloroform having been administered, Mr. Fergusson proceeded to operate in the following way:—A horizontal incision was first made (in the wrinkles of the lower eyelid) from the malar bone to the side of the nose; the line of cut was then directed at right angles to the first, down the side of the nose, and, following the curve of the nostril, to the middle of the upper lip, which was then divided by a vertical incision. The flap thus made was then reflected outwards, and the tumour exposed. This was found to occupy the left antrum, the

anterior wall of which was absorbed, allowing the growth to protrude. The removal of the tumour, which was begun from the inner side, was effected without difficulty by means of semicircular bone-forceps. Part of the orbital plate of the upper jaw-bone was absorbed; a large portion of what remained was removed by Mr. Fergusson, as was also part of the malar bone and the nasal process of the superior maxillary. The floor of the antrum was found quite healthy, and, therefore, left entire. The wound in the lip was then brought together, as in harelip, by means of needles and a twisted suture, and the rest of the wound closed by means of silk sutures.

June 5th.—All the sutures were removed, firm union having taken place. There is a free discharge from the nostril. He expresses himself quite free from pain.

The patient progressed rapidly without a bad symptom, having suffered very little inconvenience from the operation. He was discharged on the 8th of July, cured.

FIBROUS TUMOUR OF THE LEFT SUPERIOR MAXILLA, INVOLVING THE ANTRUM; REMOVAL; FATAL RESULT.

(Under the care of Mr. FERGUSSON.)

(From 'The Lancet,' January 5th, 1861.)

W. P.—, æt. 60, a man of colour, native of and resident in Barbadoes, admitted June 2d, 1860, with a tumour of the left superior maxilla. The swelling was first noticed twelve months ago; but for six months previous he had been suffering much pain in the part, for which he had had several teeth extracted. Patient is in pretty good health, but has been losing flesh of late. On admission, there is a hard and immovable swelling under the left eye, caused apparently by a tumour in the antrum, protruding its anterior wall. It encroaches on the left nostril, interfering with respiration through it. There is paralysis of sensation on the left side of the face and upper lip. The pain is constant and excessive.

June 9th.—Chloroform having been first administered, the two remaining incisor teeth were extracted, and Mr. Fergusson proceeded to make an incision, beginning over the malar bone, and extending horizontally inwards to the inner canthus of

the eye, in the wrinkles under the lower eyelid. This was continued by a vertical incision, following the curves of the nostril to the septum of the nose, where it was terminated by a vertical cut down the centre of the upper lip. The structures down to the tumour, included in the flap thus made, were then reflected outwards. Mr. Fergusson then cut through the palatine plate of the superior maxillary bone with semicircular bone-forceps; the malar bone was then divided with the same instrument, and one or two more touches of the forceps sufficed to separate the tumour from its attachments. Various portions of diseased bone were then clipped away, amongst which was the whole of the malar bone, which Mr. Fergusson found it necessary to remove. The hæmorrhage was free, but was soon stopped by the actual cautery. An examination of the tumour showed it to be a fibrous one.

The patient bled on two occasions, but did well in other respects, being kept up with enemata of beef-tea and brandy until the 25th of June, when purulent ophthalmia occurred in the left eye, the conjunctiva appearing wrinkled over the cornea, and hypopion becoming evident.

July 6th.—The patient is much weaker. The cornea appears to have ulcerated, and allowed the aqueous humour to escape. The crystalline lens also was found sticking to the eyelashes this morning.

During the next three days the patient sank rapidly, and died exhausted on the 9th of July.

FIBROID GROWTH IMBEDDED IN THE ALVEOLUS OF THE LOWER JAW; SUCCESSFUL EXTIRPATION.

(Under the care of Mr. BOWMAN.)

(From 'The Lancet,' January 5th, 1861.)

G. E.—, æt. 27, a gardener, living in the west of England. Nine years ago, a lower molar tooth on the right side became loose, and was extracted. Shortly afterwards, a tumour of the size of a hazel-nut appeared in the socket of the tooth. At the end of a year, by which time it had become of the size of a fist, he applied to a surgeon, who removed part of it by the knife, and then applied nitric acid, painting the cheek over the tumour with iodine. In eighteen months it had disappeared, and there was no return for

six years. Twelve months ago, he struck his right cheek with the corner of a spade. This appears to have started the growth afresh, for, from this time forth, the tumour began to grow in the old situation, and soon attained its original size. It now gave him very much pain, and prevented his opening his mouth further than to admit a finger. In May last the swelling softened, and he states that large portions of the tumour came away. Since that time it has remained in its present condition.

On admission, there was externally a firm round swelling over the lower jaw, protruding the cheek. Seen from within, there is a tumour extending from the back bicuspid tooth as far back as the base of the coronoid process, and it appears to spring from the alveolar region of the lower jaw. Its upper surface is divided by chinks into three or four lobes, and there is a deep furrow down the centre, where the teeth of the upper jaw have pressed upon it.

October 20th.—Chloroform having been administered, Mr. Bowman made an incision six inches in length, commencing in a vertical direction one inch below the lip, in front of the growth, and carried it downwards and then outwards beyond the base of the jaw, curving it upwards to the extent of three quarters of an inch, so as to embrace the whole extent of the tumour, but not so deep as to divide the facial artery. The mouth was then entered by raising the end of the flap in front, so as to make way for the saw, and the jaw was divided vertically, partly by the saw and partly by cutting forceps. The flap was next raised in its whole extent, the facial artery tied, and the mouth laid open as far as the back of the tumour. The jaw was now divided behind the tumour, as in front, by means of the saw and forceps, three or four small vessels were tied, the mucous membrane of the cheek united by two sutures to that reflected from the tongue to the alveoli, and the skin also united by a line of sutures. The jaw, which was now found to have fallen inwards by the action of the masticators of the left side, was brought into place, and maintained there by means of a gutta-percha apparatus fitted between the teeth of the left side. A bandage was passed under the chin to keep the mouth closed.

The tumour thus removed was found to be of a firm fibroid and apparently simple

epulis growth, imbedded in the alveolar aspect of the jaw. The original sockets of the teeth had disappeared, and the sides of the bone, as far as the lower margin, were expanded laterally to the width of two inches, the terminal edges forming an irregularly shallow cup, with sides no thicker than silver paper.

The patient went on, after the operation, without a bad symptom, and was able to take fluid nourishment from the first. The sutures were all removed by the 25th, the anterior part of the wound having healed by first intention.

October 29th.—The wound is discharging freely, the ligatures have all come away, and he now gets up daily. The gutta-percha socket is, however, still kept in the mouth, and he is not yet allowed to use the jaw.

November 5th.—The wound has quite healed. The gutta-percha socket has been removed, and he can chew meat, though not firmly as yet. The lower part of the face is a little distorted, the left corner of the mouth being drawn downwards, and the right cheek dropping slightly from the paralysis of the portio dura; he can, however, whistle. When the teeth are clenched, the middle line of the lower jaw is seen to be opposite the middle of the first upper incisor of the right side, and he has the power of moving the lower jaw laterally to the extent of half an inch.

10th.—Improving in every respect. Discharged this morning.

CYSTIC DISEASE OF THE LOWER JAW OF TWELVE YEARS' DURATION; EXTIRPATION OF THE RIGHT HALF; RECOVERY.

(Under the care of Mr. PAGET.)

(From 'The Lancet,' January 5th, 1861.)

A WOMAN, æt. 48, was admitted, in August, 1860, for cystic disease of the lower jaw. The disease commenced twelve years before as a slight swelling of the ascending ramus of the angle. Nothing was done then, and the swelling slowly increased. Eight years from the commencement, however, the disease had increased to such an extent that she was sent to the above hospital. The growth was then as large as the one for which she was last admitted, producing a general enlargement on the right side of the jaw

and cheek. Mr. Paget, on that occasion, considered the propriety of removing the bone, but as he found that the disease then consisted of one large cyst only, he merely removed the anterior wall, filled the cavity with lint, and left it to suppurate. By this treatment the disease was so far for a time cured. She remained well for two years, when another cyst was found a little higher than the first. This was treated in the same way, and she again got well. She remained so for twelve months. The disease, however, reappeared, and continued increasing until her admission for the third time. It now involved the right lower jaw, from the first molar tooth to the angle. Above the angle the bone could scarcely be said to exist; but there were one or two cysts. The zygoma was nearly destroyed, only a small part (two small stumps) being left. Mr. Paget made a vertical incision through the soft parts, on the right side of the symphysis, carrying it along the lower edge of the horizontal ramus to the angle. He next cut through the bone, partly by the saw and partly by the bone-cutting forceps. He divided the parts of the angle, and removed the diseased horizontal ramus. He then cleared out the remains of the cysts which occupied the position of the ascending ramus, pursuing it as high as the zygoma. The vessels requiring ligature were rather numerous. Mr. Paget, in his remarks after the operation, stated that the duration of the disease and the general features of the case clearly showed that the growth was not malignant, otherwise he should long ago have removed the bone.

MALIGNANT DISEASE OF THE UPPER JAW, INVOLVING THE ANTRUM, NOSE, AND ORBIT; PARTIAL REMOVAL.

(Under the care of Mr. SKEY.)

(From 'The Lancet,' January 5th, 1861.)

A CACHECTIC man, of middle age, was brought into the operating-theatre on the 17th of March, 1860, to have a tumour removed which involved the lower wall of the orbit and adjacent parts. Mr. Skey excised the eyeball, and removed piecemeal portions of a large growth which had destroyed the floor of the orbit, and perforated into the antrum and nares. Two months

before this, the patient had undergone an operation in which a large polypoid mass was removed from the nose, the nostril having been laid freely open to allow of access to its base. At that time a hope was expressed by Mr. Skey that the disease was not malignant, and would not return, although, as he stated, he had some misgivings on this point. The parts healed, and the man remained without a sign of recurrence of the growth for about a month.

After the second operation, Mr. Skey stated that the very early return of the growth and its rapid increase in size left no doubt as to its true nature. The disease had originally begun in the nose, but even at the time of the first operation there was a perforation of the orbital plate of the ethmoid bone. The edges of this perforation were, however, abrupt and definite,—not broken down as if the bones were infiltrated with deposit. Mr. Skey therefore hoped that it had been caused by pressure only. At the second operation, however, both the floor and inner wall of the orbit were found wholly destroyed, and the diseased growth extended into the antrum, nose, and orbit.

Mr. Skey remarked that he had, he feared, not accomplished much by the last operation. It was, however, an exploratory one; and had he been aware before commencing it of the extent to which the disease had advanced in all directions, he should probably not have undertaken it. To have excised the bones freely would, however, have been, if not impracticable, at any rate attended with extreme risk.

The diseased portions now removed were found to be, on examination, cancerous in their nature, and were soft and vascular. The patient subsequently left the hospital.

GREAT NORTHERN HOSPITAL.—EPITHELIAL CANCER OF THE LOWER JAW, FOR WHICH ONE HALF OF THAT BONE WAS EXCISED; GOOD RECOVERY.

(Under the care of Mr. W. ADAMS.)

(From 'The Lancet,' January 5th, 1861.)

JAMES B—, æt. 49, a short, stout, healthy-looking man, was admitted September 20th, 1860, suffering from a tumour of the lower jaw on the right side, evidently connected with the bone at the angle of the jaw, and involving part of the horizon-

tal ramus. Externally, the swelling was very considerable in the direction of the bone and towards the cheek. The skin was slightly reddened, and the integuments hard and brawny, evidently from inflammatory infiltration. This induration extended a little on to the neck, but the glands did not appear to be much enlarged. Internally, when the mouth was opened, which could only be done with difficulty, great enlargement could be seen; at the back part, this evidently depended upon a growth from the angle of the bone, of a soft fleshy-looking character, projecting upwards and backwards, and closely adapted to the right half of the soft palate. Anteriorly this internal enlargement presented only the character of a common abscess. It had been freely opened by Mr. Wallis, the house-surgeon, the day before the man's admission, and about an ounce of healthy pus let out. When first seen by Mr. Adams, this abscess was discharging freely into the mouth, and appeared to have a considerable cavity, as ascertained by passing a probe into it.

Mr. Adams considered that much of the general enlargement and induration of the integuments depended upon inflammatory infiltration, probably caused by necrosed bone, though this could not be distinctly felt; and, from the combination of abscess with the morbid growth, he took a comparatively favorable view of the case, as opposed to the idea of the malignant or cancerous nature of the disease.

History.—The man stated that between three and four months previously he perceived a small painful swelling, resembling a gum-boil, near to the angle of the jaw. At first he took but little notice of it; but in two or three weeks it increased in size, became very painful, and caused great inconvenience to the movements of the jaw. He then applied to the Royal Free Hospital, and was admitted as an out-patient. The mouth could only be partially opened, and with much pain. Two of the molar teeth on the affected side, being loose, were extracted by the house-surgeon, Mr. Hill, who states that at this time the tumour was about the size of a pigeon's egg, of a soft, spongy-looking character, and attached to the jaw apparently by a pedicle; it presented the general appearances of an epulis, and a portion of it examined under the microscope was seen to consist only of simple epithelium. The patient discontinued his attendance at this hospital, and remained without further treatment until he applied

to the Great Northern Hospital on the 18th of September. In the mean time the tumour had very rapidly enlarged, and the pain and inconvenience, especially as to the difficulty of taking food, were greatly increased.

After admission, the case was watched for a week, during which time the morbid growth very perceptibly increased, and a consultation was held, which resulted in four out of five of the surgeons agreeing that an external incision should be made, and as much of the bone, together with the morbid growth, be removed as might appear advisable.

On the 27th of September, 1860, Mr. Wm. Adams proceeded, when the patient was fully under the influence of chloroform, to make a deep semilunar incision, four inches in length, in the direction of the bone. It was now evident that the morbid growth, which presented very much the appearance of soft cancer, traversed by bands of fibrous tissue, largely implicated the bone, which was partially destroyed at the angle, and therefore he immediately decided to disarticulate and remove the right half of the lower jaw from the symphysis, where the bone was quite sound. This was readily accomplished in the ordinary way, though, in consequence of the depth to which the growth extended in the pterygo-maxillary region, the hæmorrhage was greater than generally occurs when the bone is excised for hard circumscribed tumours.

The man progressed very favorably and without any secondary hæmorrhage or other interruption. On the tenth day he was able to eat a mutton chop, and the wound presented a healthy, granulating appearance. The thickening and induration of the integuments gradually subsided, and cicatrization proceeded favorably. On the 2d of November, the wound was nearly closed, and the man left the hospital.

At the present time (Nov. 22d) the wound has a firmly cicatrized, contracted, and deeply puckered appearance, except at one part, where a small aperture still communicates with the mouth, like a fistulous opening; this will probably be closed in a short time. The surrounding induration has subsided in a most favorable manner.

The tumour was submitted to the Pathological Society on Oct. 23d, and described by Mr. Adams as an example of epithelial cancer, and in a further report of the specimen, made at the request of the Society by Dr. Wilks and Mr. Holmes, this opinion was confirmed. The tumour was

of soft consistence, more or less lobulated in form, and on section presented a uniform white colour, its structure being traversed by dense fibrous bands, having an irregular reticulate arrangement, forming meshes in which the soft tissue was contained. The arrangement was obvious to the naked eye, and still more so under a low magnifying power. Microscopically examined, the soft tissue, whether taken from the central portion or near to the surface, exhibited the ordinary characters of epithelial cell-formation—i. e., epithelial cells of all forms and sizes, masses of clear polygonal cells, with round or oval nuclei in some parts, and in other portions small round or oval nuclei, best seen after the addition of acetic acid. Good specimens of the laminated capsules, met with in epithelioma, were not obtained, but some rounded masses resembling these were present. No myeloid cells were seen, even in the portions of the morbid growth which extended into the interior of the horizontal ramus of the jaw. The fibrous bands consisted of simple fibrous tissue, as well as of nucleated fibres.

The tumour was intimately connected with the bone, and not only extended outwards but had eaten its way into the substance of the jaw, entirely destroying the bone from the angle to within an inch of the symphysis, where it filled the cavity of the bone. In the operation, some portions of the bone were found nearly detached, and broke away; and this condition had probably given rise to much of the common inflammatory mischief and the abscess, which tended to obscure the diagnosis of the precise nature of the morbid growth. The bone was quite healthy where sawn through near to the symphysis.

UNIVERSITY COLLEGE HOSPITAL. —FIBROUS TUMOUR OF THE SUPERIOR MAXILLA IN A GIRL; SUCCESSFUL REMOVAL.

(Under the care of Mr. QUAIN.)

(From 'The Lancet,' January 5th, 1861.)

THE following case is abridged from the notes of Mr. Winterbottom, late house-surgeon to the hospital, and formed the subject of a clinical lecture by Mr. Quain.

E. M.—, æt. 15, was admitted April 28th, 1859. In the summer previous she was struck on the left side of the nose by a

shutter; the face swelled, but quickly got well, and nothing was noticed till the Christmas following, when she perceived that the same side of her face was enlarged. A month later she observed a swelling on the gum, and went to a surgeon, who extracted the left lateral incisor, and afterwards lanced the gums, letting out some matter.

On her admission, there is found beneath the soft parts on the left side, along the side of the nose and below the eye, a swelling of the size of a flattened walnut. It extends inwards, encroaching on the ala of the nose, and reaches to within a finger's breadth of the margin of the lower eyelid; it covers the body and anterior surface of the superior maxillary bone, and is continued down to the gum. When the lip is raised several decayed teeth are seen—two middle incisors and one lateral; and on the left side, where several teeth have been removed, a considerable swelling is found projecting on the anterior surface of the alveolar process. This is elastic to the touch when felt beneath the integuments, and yields distinctly all over the surface. There is also a degree of elasticity at the lower margin of the gums, in the space unoccupied by teeth. There is no change in the roof of the mouth. A very slight degree of fulness is perceived in the left nostril. The glands in the right axilla have been enlarged for some time; those under the angle of the jaw are also enlarged. There is no pain, and the patient is very anxious to have the growth removed.

May 19th, 1859.—The patient being narcotized with chloroform, Mr. Quain made an incision through the integuments extending from half an inch below the inner angle of the left eye to the angle of the mouth, and dissected back the flaps on either side so as completely to expose the tumour. The bone was then divided in the middle line, and again obliquely behind the growth. The part included by these was removed by means of a cross cut above. There was a good deal of hæmorrhage, but it was controlled by the free application of the solution of the perchloride of iron. Six hours afterwards, the flaps of skin were brought together with hare-lip pins and sutures. The nature of the tumour was believed by Dr. Jenner to be fibro-plastic.

After the operation the patient progressed most favorably. The external wound was quite healed by the 1st of July. The cavity was considerably closed by the 23d of the same month, without the appearance

of any secondary growth. There was no deformity, and the patient left the hospital. On presenting herself at the hospital on the 29th of November, she was found to have grown, her face was fuller, and the opening into the antrum was perfectly sound.

CANCER OF THE TONGUE, EXTENDING TO THE TONSIL—RAPID PROGRESS.

(From the 'Medical Times and Gazette,'
Dec. 1, 1860.)

JOSEPH C—, a chair-maker, æt. 66, was admitted under my own care, for ulcers of the leg, on November 15, 1859. He was a tall, thin, pallid man, of yellow faded-leaf complexion. He attended, and very regularly, for ulcer of the leg, but did not draw attention to his tongue until January 13, 1860, and then only on account of the severe pain, which kept him awake. It was then found that the right side of the base of the tongue, the right arch of the palate, the tonsil and adjacent structures, were involved in one mass of malignant growth, which had ulcerated extensively. There was an enlarged gland, overlying the bifurcation of the carotid. It was ascertained that he had had pains in his tongue for about a year, which got much worse during the last two months. He had latterly experienced much difficulty and pain in swallowing. He had been a great smoker, and had always smoked with the pipe on the right side of his mouth. The man continued to attend for a few months after the discovery of the state of his tongue. The ulceration rapidly advanced, and the gland got much larger. When he ceased to come to the hospital it was because he was getting too feeble. It is probable that he has since died.

CANCER OF THE TONGUE — REMOVAL BY LIGATURE — RETURN OF THE DISEASE — DEATH.

(Under the care of Mr. De Morgan.)

(From the 'Med. Times and Gazette,' Dec. 1, 1860.)

CAROLINE C—, æt. 35, a married woman,

and the mother of three children, was admitted in February, 1855. She was subject to dyspepsia; but during the last few years she had been in rather better health. She had broken teeth on the right side of her mouth, which had irritated the tongue. Two years before her admission she noticed that her tongue was sore, and a year ago a lump began to form in it. Mr. De Morgan removed the right side and tip of the tongue by ligature. He made an incision in the median line beneath the jaw, and dissected his way upwards, and then, having passed the ligature, tied it over a wooden bridge, which was fixed as a sort of tourniquet. In ten days or a fortnight it had separated. On March 19 both the wound below the jaw and that of the tongue were quite healed. There was then however, suspicious hardening about the cicatrix. The disease soon afterwards returned in the stump, and in the course of a few months the woman died.

CANCER OF THE TONGUE AND OF THE SUBMAXILLARY LYMPHATIC GLANDS.

(Under the care of Mr. M'MURDO.)

(From the 'Med. Times and Gazette,' Dec. 1, 1860.)

DANIEL H—, æt. 46, was admitted November 2, 1860. He stated that twelve months ago he experienced a soreness of his tongue on the left side, which he imagined was due to irritation of some decayed teeth. Several had been removed in consequence, but nothing was done for the tongue. The ulcer in the latter grew more painful, and five months ago the glands below the jaw began to enlarge. There is at present an ulcer on the left and under side of the tongue. This half of the tongue is hardened, swollen, and very painful; and he speaks with great difficulty from pain in moving the tongue, which is also not able to be much moved from being swollen, and tied down by the ulceration and induration. He suffers a great deal of pain. His health has generally been good, and he says that, except for the local distress, he feels well. He is, however, very sallow, haggard, and emaciated.

British Journal of Dental Science.

LONDON, JANUARY, 1861.

It is long since a new year has opened with less to excite our anxiety for the future, or with such promise of political tranquillity in our profession, than the present one; indeed, it is assumed by some that we have arrived at the conclusion of the struggle between parties, that each should resolve to lay down its arms and watch for the present how the different institutions, for which the battles have been fought, will bear the test of time and trial. But we cannot think this a correct view of the present position of affairs. It is true we have little more to obtain or wish for than that which time will give, the great foundation being laid, in the legal recognition of Dentistry AS A PROFESSION. We have our Board of Examiners, composed of eminent dentists, associated with some of the most honoured names in the medical world; we have the diploma issued by them, depending for its value, not upon any superficial appearances of flourishing calligraphy and suppositious coats of arms, but upon the six names attached. Moreover, our Board of Examiners holds its sittings in the halls, and forms part of the executive of a corporation, which, for learning and fame, stands second to none in the world. We have our hospital for the special treatment of diseases of the teeth, with its staff of officers of acknowledged weight and reputation, and its attendant school, where pupils are instructed by gentlemen eminently qualified to teach students the profession they have long practised. If we add to this that we have a society for the discussion of scientific subjects connected with our profes-

sion, with a daily increasing library and museum, a society of which many of our American brethren, already rich in similar institutions, are pleased to become members, we think we may fairly repeat there is left but little for us to desire beyond the consolidation and improvement of what we already possess. But we should neglect the interest of our readers were we to forget that there is still a party which, although it represents the profession neither in respect of numbers, education, nor intelligence, yet is the exponent of those who, for purposes best known to themselves, throw aside the rules which bind honorable men in dealing with disputed questions.

The irresistible tendency to deal unfairly with the profession in the statement of their own case may render it very desirable for them that each party should, for the future, be allowed to tell its own tale uncontradicted, and to work its own way without comment.

But the evil which would arise from silence on our part is foreshadowed in the character of the communications forwarded to the American Dental Journals. Could our transatlantic brethren visit England for a short period, they would be considerably astonished to find how misled they have been by the letters of "our London correspondent." For what, in reality, is the true position of affairs? On the one side we have, in the gentlemen who compose the Odontological Society and those who appear in the list of dental licentiates of the Royal College of Surgeons, nearly all the weight, intellectually and socially speaking, of the profession. The names do not, it is true, show

so lengthened a roll as, for the credit of dentistry, we could wish, but still the list contains nearly every practitioner, metropolitan and provincial, whose name is known beyond his own immediate circle. If any other published list of individuals who designate themselves "dentists" be scrutinised with ordinary care, it will be found to consist (after excluding chemists, barbers, blacksmiths, photographers, &c.) almost entirely of *cit-diant* workmen—good mechanics, it may be, but, with their present attainments, unable to hold the position of professional men—and of advertising dentists. This circumstance would afford a sufficient explanation of the boasted six thousand signatures of medical men against the admission of "dentists" to any union with them in the College of Surgeons. We have on the other side the "College of Dentists," so called, "of England," composed, in the first instance, of three or four gentlemen wholly unknown to fame, save through the medium of their numerous official circulars, with, we regret to add, two or three gentlemen of considerable standing, who are worthy to be found among the supporters of a better cause. The name of one practitioner appears who, after strenuously supporting, and then as violently denouncing, the College of Dentists, is now apparently on the high road to be its president. These gentlemen constitute, in reality, the so-called "College of Dentists of England," for if we analyse their list of followers it will be found to consist almost exclusively of their workmen, their pupils, and their immediate personal friends in the provinces, with practi-

tioners residing in other countries, who are utterly ignorant of the real position of affairs, or are allured by the magniloquent title, "Member of the College of Dentists of England." We cannot, therefore, regard these individuals as representatives of even a hundredth part of the "profession." Again, many of the outsiders must be looked upon only as simple handicraftsmen, who pursue the *TRADE* of dentistry, as recently argued by one of their own advocates in the late trial of Morrison v. Churchill; many, again, can scarcely plead "not guilty" to a breach of the regulations of both existing Dental Societies as to advertising, &c.; those who can, we feel confident, will, sooner or later, join themselves to the professional section,* while the remainder will, we doubt not, be received with open arms by the "College of Dentists."

Under these circumstances we are not content to admit that we have arrived at the conclusion of the struggle. We look upon the "College of Dentists" as a positive evil, calculated to mislead the public and to encourage a low tone of professional conduct among dental practitioners.

* In respect to those practitioners who have not enjoyed any further advantages than the work-room affords, it has been clearly shown that, by application, the knowledge which will enable them to obtain the dental diploma is quite within their reach, and the honorable examples of success now before the profession have stimulated many similarly placed to work earnestly towards the same laudable end. Too much praise cannot be given to those members of our calling who, under circumstances of difficulty, have, unaided, taken the only means of raising their status by qualifying themselves to hold a professional position.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

To the Editor of the 'British Journal of Dental Science.'

IN recording the names of members admitted to the Odontological Society at last meeting my name ran thus—

"Josiah Walker, M.R.C.S.E., 13, Holles Street."

It should be—

"Joseph Walker, M.R.C.S.E. L.D.S. B.C.S., 82, Wimpole Street, W."

I thought it right to call your attention to this slight inaccuracy.

I remain,

Yours faithfully,

J. WALKER.

82, Wimpole Street, W.;
Jan. 1st, 1861.

To the Editor of the 'British Journal of Dental Science.'

SIR,—Mastich in solution being generally used by the profession as a temporary stopping, I beg to acquaint your readers with my manner of employing it, which I presume to be novel, as I have never seen it recommended.

As much wool as seems necessary to fill the cavity being saturated with Ash's cement, I take it up with a stopping instrument, and put it into a glass of water. After two or three minutes it is with-

drawn, and any superfluous cement squeezed out on a card. It is then, still on the point of the stopper, put into the water again, and in a minute or so afterwards it is non-adherent to the fingers, and may be rolled between them to any shape. If apparently too much for the cavity, a part may be cut off with scissors. The pellet of stopping is now most manageable, and may be pressed lightly or firmly into the cavity by a round bur-nisher, or any tool which will smooth the surface nicely.

Much time in the operating-room is saved by this simple plan, and when the stopping is thus applied over arsenic, the inconvenience of frequently withdrawing the arsenic application, through the tool adhering to the uncoagulated mastich stopping, is avoided.

At the meeting of the Odontological Society, as reported in the last number of your Journal, the president described the mode he practises in using mastich as a temporary stopping over arsenic; but I think he would, after a few trials, prefer the one above mentioned, and which I have been using for some months past with great satisfaction.

I am, Sir,

Your obedient servant,

A. STEWART, F.R.C.S.E.

112, Cheapside;
January 4th, 1861.

Literary Notices and Selections.

Dentist's Handy Book and Appointment Register. London: H. Baillière.

It is, perhaps, scarcely fair to criticise too keenly the "first annual issue" of a compilation the author of which had no model on which to build or improve; but

as he invites "suggestions for improvement," we are induced to point out what we should consider as such.

The book is rather too large for the pocket, and much too small for the desk. If intended for the pocket, it should have been reduced to much smaller dimensions,

and the forty-four pages at the beginning, and the twenty-two pages at the end, of printed matter and advertisements should have been reduced within reasonable limits. If intended for the desk, then we cannot see why so small a size should have been selected, as an additional inch from back to edge would have rendered cramped writing unnecessary.

We should suggest also that the right-hand page, instead of being ruled as the left, and parcelled into two days should be left blank, with an *£ s. d.* column at the edge. Thus an appointment might be registered for a future day in the left page, and the fee entered in due course in the right, when the operation was performed. Of course such an arrangement would have the effect of thickening the volume, but this addition would enhance its usefulness and dispense with the neces-

sity for other books which the 'Handy Book,' as at present compiled, does not.

We think too, that as the "particulars of the various institutions established in England will be found detailed without reference to political bias, the curtain being drawn so as to exhibit these institutions as they exist, for purposes of information only" (we quote from the compiler's *address*), the prominent position should have been accorded to that one which even members of the College of Dentists must in their heart of hearts acknowledge to rank first, if only from the fact of its legal rights. Without such a profession as the above, the fact that particulars relating to the dental diploma issued by the Royal College of Surgeons should have been placed second on the list, might pass.

Dental News and Critical Reports.

ODONTOLOGICAL SOCIETY OF LONDON.

January 7th, 1861.

ANNIVERSARY MEETING.

W. A. HARRISON, Esq., President, in the chair.

This being the Annual General Meeting of the Society, it was occupied by the special business to which that meeting is appropriated, including the consideration of a proposition from the council to increase its number, for the future, by five members, three to be chosen from the resident, and two from the non-resident members of the Society.

This proposition having been carried unanimously, the Society proceeded to ballot for the officers and councillors for the ensuing year, when the following were elected:

President: W. M. Bigg, Esq.

Vice-Presidents: John Tomes, Esq., S. Cartwright, Jun., Esq., Edwin Saunders, Esq., John Martin, Esq., *Portsmouth*, T. G. Palmer, Esq., *Cheltenham*, Robt. Brookhouse, Esq., *Manchester*.

Treasurer: Arnold Rogers, Esq.

Honorary Secretaries: (for foreign correspondence) Thomas A. Rogers, Esq.—

(Ordinary) Alfred Canton, Esq., G. A. Ibbetson, Esq.

Council: J. B. Fletcher, Esq., T. Underwood, Esq., H. J. Barrett, Esq., W. A. N. Cattlin, Esq., J. R. Mummery, Esq., Samuel Maclean, Esq., John Drew, Esq., Isaac Sheffield, Esq., Alfred Coleman, Esq., T. R. M. English, Esq., *Birmingham*; W. K. Bridgeman, Esq., *Norwich*; George Parkinson, Esq., *Bath*; H. A. Dewar, Esq., *Aberdeen*; R. H. Moore, Esq., *Dublin*.

The TREASURER then read the following report:

The Treasurer's Report.

GENTLEMEN,—I am happy to have it in my power, at the close of another (and my last) year of office, to congratulate you on the financial state of the Society. The total receipts of the past year have been £254 2s., while the expenditure for the same period has been £161 14s. 3d. which includes our rent up to the present time. The total receipts of the Society since its formation amount to £1035 6s., and the balance which I shall have the satisfaction to hand over to my successor will be £407 17s. 6d., of which £200 has been lying at interest.

On retiring from the office of treasurer,

to which you did me the honour to elect me at the formation of the Society, which I have held under four successive reigns or presiderhips, and through five ministrations or secretariats, and during which long period the duties have been so lightened by your kind courtesy and consideration, permit me to thank you all very sincerely, and to assure you of my unabated interest in, and hearty wish for, its continued and increasing welfare and prosperity.

EDWIN SAUNDERS.

MR. CARTWRIGHT.—Mr. President, if you will allow me (and I think this is the most fitting time to mention it), I will propose, and I am sure that all the members of our Society present will be happy to vote, cordial expressions of thanks to Mr. Saunders for the way in which he has conducted those financial arrangements which belong to the office of treasurer. During his sway the funds have flourished; and although we have experienced a loss by his resignation of the office of treasurer, I am happy to find that we shall still retain him on the council of the Society. The treasurer'ship, too, I am glad to find, will be in the hands of a gentleman who is in all respects well fitted for the position. I beg to propose a cordial vote of thanks to Mr. Saunders on this occasion.

This was seconded by Mr. Parkinson, and carried by acclamation.

The TREASURER having briefly returned thanks, the following contribution to the museum from Mr. Crampton (which we will describe in his own words) was then announced.

Memorandum relating to Jaw Bones (sent from Eveline, October 9th, 1860) taken from a Saxon burial-ground, recently discovered at Long Wettenham, near Abingdon, and disinterred in the course of the present and last year.

The weapons and other objects found with the skeletons point distinctly to a period not very far removed from the introduction of Christianity by St. Augustine; and these remains can scarcely be later than the eighth century, if indeed they do not belong to the seventh.

No. 1.—Perfect under-jaw of male. The weapons found with this subject denoted a person of some importance.

No. 2.—About two thirds of under jaw-bone belonging to a female skeleton, probably a woman of the lower classes. She must have been very nearly six feet high. The bones were most extraordinarily massive.

Nos. 3 and 4.—Portions of upper and under jaw of a young person (sex uncertain). One second series of teeth only partially developed.

The soil of the locality is the deep alluvial loam of the Thames valley, resting upon gravel. The bodies are found at a depth below the present surface of about four feet. The graves seem just to have penetrated the gravelly substratum. There is no perceptible trace of any coffin or envelope of any kind; nor anything in the nature of the soil to account for the remarkable preservation of the remains.

Mr. SAUNDERS then presented to the Society the volume of photographs of its members, which he had been collecting for some months, in the following words:

MR. PRESIDENT AND GENTLEMEN,—I was resolved that this meeting should not pass over without witnessing the fulfilment of an intention which I have long cherished, and of which I made an announcement in the early part of last summer. It appeared to me, that a pictorial record of the first association of members of our profession in this country, such as the advanced state of photographic art renders easy of attainment, could not fail to be of great interest both now and hereafter. To this end, I addressed a circular, in the month of June last, to every member of our Society, the replies to which furnish another illustration of the proverb "Quot homines, tot sententiæ." From the great majority I received favorable and courteous replies, as would naturally be expected from a body of gentlemen. Some however, from whom better things might have been expected, have not deigned to notice my communication, and I am in ignorance, at this moment, whether they intend to comply or not with my request. Some have pleaded diffidence, which I have generally succeeded in removing; one inquires if I have any design of playing the detective over the Society; and in one instance, and one only, compliance with my request has, I regret to say, been declined. On the whole, however, the correspondence which has arisen from the carrying out of the scheme has been the occasion of a display of cordiality and kind feeling which has been especially gratifying. It only remains for me to beg the Society to receive the volume, to confide it to the care of the librarian, who will, I feel confident, willingly take charge of any future contributions that may arrive—and very many are promised—and to wish the Society a new year as happy, as prosperous, as improving, as

the one now so ably presided over, and of which we this evening celebrate the close.

Mr. IBBETSON.—I think, sir, that Mr. Saunders is entitled to a special vote of thanks for the very handsome volume which he has presented to the Society, for the photographs of its members. Mr. Saunders' contributions to the museum have been exceedingly numerous, and are of great value. This offering, however, is of a totally different nature, and is just characteristic of Mr. Saunders' spirit. We all—or most of us—remember the hospitable manner in which he entertained the members at the inauguration of this Society, which is now so well established; and his present donation forms a very graceful conclusion to his treasurership. I move, therefore, sir, that a special vote of thanks be accorded to Mr. Saunders for his presentation of this volume for the photographs of the members.

This proposition having been seconded, was also carried by acclamation.

The **PRESIDENT** then announced that he had presented to the Society the clock which they saw hanging over the mantel-piece.

Special votes of thanks were also presented to Mr. Crampton, and the President, for their respective valuable presents.

The entire list of contributions to the library and museum for the past year was then read over, which was as follows:

Name of Donor.	Nature of Present.
D. D. Hepburn, of Nottingham	A variety of interesting models.
R. Hepburn, London	Ditto ditto.
Arnold Rogers	His portrait in oil colours, he being the second president of the Odontological Society.
Mr. Palmer, of Cheltenham	Two models illustrating a case of wasting away of the upper incisors.
Mr. Maclean	A model of a mouth, the central incisors of which had been lost from a blow of a stone at 9 years of age. The model, which was taken at the age of 45, showed that nature had repaired the loss by the approximation of the adjoining teeth.
Mr. Speacer Cockings	Berdmore's 'Treatise on the Teeth and Gums,' and other pamphlets.
Mr. Jameson	A collection of interesting models.

Name of Donor.	Nature of Present.
Dr. Levison	A variety of models, including some casts of mouths deficient in teeth.
Mr. Parsons, of Halifax	An instrument called a pelican for extracting teeth, and Berdmore 'On the Teeth.'
Mr. Edwin Sanders	Lower maxilla exhibiting ankylosis of second temporary molar, left side, with the bone. A superior maxillary bone of the right side, showing the canine tooth lying obliquely in the jaw. Inferior maxillary bone, showing separation of the central incisors. Superior maxillary bone, showing two supernumerary teeth placed in the dental arch, between the lateral and central incisors of left side. Superior maxillary bone, showing supernumerary tooth placed between left lateral incisor and canine. Inferior maxillary bone, showing dens sapientie of each side, placed between the condyle and coronoid process. Mass of salivary calculus attached to artificial teeth. Anatomical preparation showing the vessels and nerves of the teeth. A volume for the photographs of the members of the Society.
Mr. Forsyth	An anatomical preparation of a skull of a cat.
Mr. Saunder	A model illustrative of irregularity of the teeth in the lower jaw.
Dr. Mac Quillan	A plaster cast of the head of a gorilla. Two magnified casts of bicuspid teeth, illustrating the contributor's treatment of caries of the mesial and distal approximal surfaces of this class of teeth.
Mr. Thomas Bell	Three models illustrative of the eruption of teeth at very advanced periods of life.
Mr. Palmer, of Cheltenham	A model showing a canine tooth of the upper jaw, occupying a space in the alveolar arch, between the first and second molars.
Mr. Vanderpant	A preparation showing six incisors in the upper jaw.
Mr. T. T. Edmonds	A very curious instrument, of French invention, for extracting molar teeth, and the key instrument with which the donor extracted some teeth of the late Joseph Bonaparte.

Name of Donor.	Nature of Present.
Mr. Fletcher	A second molar tooth showing considerable absorption of the distal surface caused by pressure of the dens sapientie.

The following gentlemen were elected members of the Society during the evening, viz., (resident) Mr. Alfred Hill, L.D.S., of 38, Euston Square, and Mr. James Kempe Devonshire, L.D.S., of Great Coram Street, Brunswick Square; and (non-resident) Mr. Charles Bygrave, of 3, Rue Lafitte, Paris, and Mr. Daniel Corbett, M.B.C.S., of Dublin.

The following gentlemen were also proposed as candidates for the membership, viz., Mr. Edwin Trueman, M.B.C.S., of 23, Old Burlington Street; and Mr. George Cussons, of York.

The special business of the meeting being completed, the PRESIDENT delivered the following address:

Gentlemen,—Inasmuch as in societies of this kind it is usually expected from the retiring President that he should deliver a short address, enumerating and commenting upon those events which have occurred during his year of office, that bear upon the interests of the society over which he has had the honour of presiding, and of the profession to which that Society belongs, I conclude that such a course will be expected from me; and I will beg your indulgence, therefore, for a short time, while I proceed briefly to touch upon those events of the year just concluded, bearing upon our profession, and upon our Society, which appear to me to require my doing so.

I will take those which bear upon the interests of the profession at large first.

Looking at those events in the order of their succession, the first that occupied the attention of our profession prominently in the early part of the year is one which, if I could follow my inclination, I would rather not allude to, seeing that it launches me at once into the troubled sea of dental politics, which it is neither my wish nor my intention to enter upon further than is unavoidable. Nevertheless, it is one which formed too prominent a fact in the annals of our profession of this year, to be passed over in silence. I allude to the protest which was put out in the spring by certain members of our profession against the intended proceedings of the College of

Dentists, with reference to the issuing of diplomas, and the counter-protest with which it was met. It is not my intention, as I have just remarked, to enter at any length into dental politics; but I cannot say less, with reference to that proceeding, than this—that, after this lapse of time, I see no reason to regret, but, on the contrary, every reason to justify the proceedings of the party with whom I had the honour to act in that matter—because I still think that such a course was called for by the then threatened proceedings of the College of Dentists—was right in itself—and was, on the whole, productive of good. More I will not, at this distance of time, say upon this subject.

The next important event, I think, to be referred to, and one on which I have much more pleasure in dwelling, is the completion of the formation of the Board of Examiners in Dental Surgery by the College of Surgeons. All of you will remember, that this Board was in progress of formation at the latter part of the previous year, as a consequence of the dental charter then recently obtained by the College of Surgeons; but that its final completion was retarded for months, owing to the slowness with which corporate bodies almost necessarily move.

All necessary preliminary arrangements being completed, the examiners of that Board were elected on the 18th of February last; and on the 13th of the March following, the first legally authorised examination in dental surgery was held. This I consider to be one of the most important events of the year, bearing upon our profession, inasmuch as it at once brought it out of the anomalous position in which it stood before, into one which, although its well-wishers have all along contended it was fully entitled to, had nevertheless not been previously *legally* awarded to it. It raised it, beyond a doubt, legally to the level of a profession; and will go far, if its advantages are properly followed up, to place it on a par with other professions. It was in itself, therefore, a circumstance at which, I think, we cannot too much rejoice.

With reference to the constitution of this Dental Board, I think it cannot fail to have given satisfaction to every well-wisher of the profession. The anatomical portion of it is formed of three of the most eminent surgeons of the day; and its dental portion, of three dentists, than whom, I have no hesitation in saying, three fitter

men could not have been found for the office. (Cheers.) It must be a matter of satisfaction, also, to us all, to have noticed the number of gentlemen who have availed themselves of this diploma during the short time it has been in existence. Within the first three months after the Board commenced its duties, one hundred gentlemen had taken out the diploma—among them men of established reputation, of large practice, and even in advanced life—a fact which shows the estimation in which it is held by the members of our profession. Since that time, many others have taken out this diploma (I am not aware of the exact number, but I believe twenty or thirty more), and there are others, I know, coming on. These are facts, gentlemen, that speak volumes, and with which we cannot but be much pleased.

The next subject in order of time, and of importance, too, that I have to notice, is the opening of the London School of Dental Surgery, in connexion with the hospital under the roof of which we are at present assembled. That school, as we all of us know, had been contemplated, and I may say was formed, before the termination of the last year; but the proper time for opening it had not arrived until the period of this year at which the summer courses of lectures ordinarily given at the medical schools are delivered—the projectors of that school having (and I think very wisely) thought that, in forming a dental school in connexion with the course of education required by the College of Surgeons, it was not necessary to institute, at such a school, lectures on those branches of science required to complete the education of the dentist which were taught in the existing medical and surgical schools; and that it was only desirable to institute at this school lectures on those *special* departments connected with dentistry which are not given elsewhere. Four courses of lectures on these special subjects were determined upon; and the school was opened, on the 30th of April last, with an address delivered by our esteemed member, Mr. Cartwright, which I am sure you must all of you remember with pleasure and with admiration. The opening of the school has been followed by the delivery of a course of lectures by each of the gentlemen appointed for the purpose—one of whom was Mr. Cartwright himself; and I may say of these gentlemen, as, a little while ago, I said of those forming the Dental Board, that I do not think four gentlemen

better fitted to lecture upon the subjects which they were respectively appointed to lecture upon could have been chosen. (Cheers.) I have myself attended some of those lectures (and would gladly have attended more had circumstances permitted), and can say from personal observation, therefore, independently of what we should all have anticipated from the well-known acquirements of these gentlemen, that their lectures are of the most instructive kind, and such as I think the rising generation of dentists may be thankful that they have the opportunity of profiting by. I think therefore, gentlemen, that the school established in connexion with this hospital (which in itself affords so admirable a field for the acquisition of practical information in our profession) is one of the events in the history of the year which we may all of us honestly rejoice at.

While on this subject, I feel myself called upon to notice, and I have very great pleasure in doing so, the dental school established by the promoters of the College of Dentists. That school was opened before the commencement of my year of office, and may not therefore be considered by some as coming fairly within the scope of these remarks; but, although I am in no way connected with the College of Dentists, and feel bound in candour here to say that I regret many of the proceedings of its promoters, yet I feel also bound to say that I am by no means blind to the advantages to the profession of some of its acts, and that among those of its acts that have my approbation is the formation of this school. I think the establishment of such a school good in itself—and I think it likely to do good by promoting emulation (I hope it will always be a generous one) between the two schools—for both of which I think there is room in this metropolis. Entertaining these feelings, I have felt it to be right here to allude to it, and to record my approbation of its establishment.

The next subject I come to, in reviewing the events of the past year, gentlemen, is one which I feel some delicacy in alluding to, and one which, I dare say, some gentlemen in this room will think I am rather bold in venturing to touch upon; but it is a subject which has occupied so much of the attention of the profession, and which involves a principle of so much importance in connexion with it, that I should not feel myself justified in passing it over in silence, in an address of this kind. The subject

to which I now allude is the trial of "*Morrison v. Churchill*." The circumstances which led to that trial are doubtless familiar to you all. The article which led to the action has probably been read by all of you; and I dare say you have all formed your opinions upon it, and upon the events which have followed it. I have formed my opinion, and I do not think it right in an address of this kind, as I have already said, to shrink from giving utterance to it. My opinion, gentlemen, I have no hesitation in stating, goes fully with the editor and the proprietors of the Journal in which that article appeared, in the course which they have taken in this matter. I do not mean to say that, had the article which gave rise to that action been looked over by some one experienced in the law, it might not have been altered advantageously, so as to have kept them from falling within the trammels of the law of libel, and yet have answered the purpose for which it was intended; but still, looking at the object of that article, looking at the fact that it was an attack upon a system, which all of us who have the elevation of our profession at heart consider degrading to it—and considering that the instance referred to, and which led to this action, was merely adduced as an example of this system—I do say, that I think the proprietors of that Journal are entitled to our gratitude for the firmness they have displayed, and for the course they have adopted under the circumstances of the case, throughout. It is to be regretted, perhaps, that Mr. Morrison has had what seems to be a triumph, for a time; but I regard it as a mere *seeming* triumph, and not as a real one. He has purchased that triumph, such as it is, at the expense of losing his professional status—his own counsel, as you all know, having, doubtless to carry his point, described him in his speech as a tradesman—a *handicraftsman*—and not a professional man. That alone, I think, must have materially lessened the satisfaction with which Mr. Morrison received that verdict. I have observed, with great pleasure, the course which has been adopted, in reference to this matter, by certain members of the profession, who think that the proprietors of the Journal ought to be indemnified for the expense to which they have been subjected by this trial; and I see in that, again, another circumstance which I think must very materially diminish any satisfaction Mr. Morrison may have felt

in having gained that verdict—inasmuch as it shows the feeling of the profession on the subject. In reference to this movement, I feel bound to say, that I sincerely hope, *on public grounds*, that it will be successful. On private grounds, I happen to know that the proprietors are perfectly indifferent about it, and are ready cheerfully to bear the expenses which have been put upon them by these proceedings, feeling that they have been incurred in carrying out what they conceived to be a duty to the profession; but, on public grounds, I have no doubt that it would be very gratifying to them to receive an indemnity—inasmuch as the mere fact of the profession taking up the matter, and raising a fund to meet the expenses, will be a proof, and a direct expression, of its feeling upon the subject. I have thought it right to say so much upon this subject, because it has been one which has interested us much during the latter part of the year, and because it is one the result of which involves a great principle;—viz., whether the profession, as a body, is, or is not, willing to countenance this system of advertising. I must then, again say, that, personally, I am exceedingly anxious to see this movement carried out successfully, *on public grounds*—as showing the feeling of the profession, as a body, on this point—and as proving to those men who are desirous of raising its status, that they will be supported in any honest attempt they may make to do so. (Cheers.)

I think, gentlemen, that I have now run over the most important events of a public nature, connected with our profession, that have occurred during the year; and I turn from them (or some of them, at any rate), with very great pleasure, to circumstances more particularly connected with the proceedings of this Society—topics which are, to my mind, very much more interesting than some of those I have just felt it to be my duty to allude to.

And, first, gentlemen, I beg to express to you the satisfaction I have felt, as your President, at the excellent attendances we have had at our meetings during the year just ended, and the admirable papers read and communications made at those meetings, by various members. The papers we have had have been varied in character, and all of a nature calculated, I think, to raise the Society in the opinion of the scientific public. We have had papers so purely scientific (as, for instance, those by Mr. Mummery) as not to admit of discussion, while we have had, on the

other hand, papers of an exceedingly practical nature, and such as necessarily led to discussion; and I think I may say, without arrogating too much to ourselves, that our discussions during the year have been such as to redound much to the credit of the Society.

The next subject upon which I shall touch is the progress of the Society. I find, from a list with which our secretary has kindly furnished me, that during the year, we have elected twenty-five new members, and have had but one resignation—leaving an increase of twenty-four—and that we have now, altogether, 173 members. Considering the comparatively short time the Society has existed, and looking at the divided state of the profession upon certain points, and at the fact, that the rules under which persons are admitted as members of this Society, are somewhat stringent, I think we may fairly congratulate ourselves upon the position in which we stand as to numbers. (Cheers.)

The next point on which I have to remark, and to congratulate you, is the very satisfactory report we have had to-night from our late excellent treasurer. You have already expressed your opinion on this report, and on the admirable manner in which he has managed our funds during his tenure of office, by the applause with which it was received, and by the very complimentary and cordial vote of thanks you have passed to him. I will only say, on this subject, that I fully concur in all that has been said of him, and most heartily join in that vote of thanks; and am much gratified to find that, when losing him as our treasurer, we shall still retain him in office in the higher position of one of our vice-presidents.

The next subject upon which I would make a few observations is the contributions we have had to the library and museum during the year. The contributions to the museum you have just heard read over. They have been numerous and valuable; and I think that, on the whole, they have been quite as numerous as, and perhaps more so than, even the most sanguine expectations of its originators could have anticipated. I think therefore we may be well satisfied with the progress we are making in that way. With reference to the library, I wish I could say as much. When it was first opened there was a slight spurt, if I may use the expression, and a certain number of members presented to it books; but, for a considerable period, I regret to say, we have

had no books presented. I think it right to notice this fact, because, if we are to get together a library, we must either look to more zeal on the part of the members in presenting books, or look to some other source—the number of books that we have received during the year being, I feel bound to say, not entirely satisfactory.

The next subject upon which I would say a few words is the prospect we have of another volume of 'Transactions.' I have to inform the Society that a committee, consisting of three members of the council (Messrs. Fletcher, Barrett, and Sercombe), have been going through a very arduous duty in arranging the papers which have been read before the Society since the publication of the last volume, with a view to the publication of another—which, I can have no doubt, from my recollection of those papers, will prove as creditable to the Society as the first. Their labours, I am told, are in a very advanced state of progress, and I hope that they will be ready soon to go to press. It was in connection with the publication of that volume, that I just now gave the notice from the chair, requesting those gentlemen who had not yet sent in replies to the circulars which have been addressed to them by this committee to do so without further delay. I cannot conclude my remarks upon this subject, gentlemen, without expressing my sense of the obligation we owe to those gentlemen who have formed the Publication Committee. Their labours must have been, I know, most engrossing and arduous.

Lastly, gentlemen, I have now to return to you my personal thanks for the support I have received from you during my year of office. (Cheers.) This is a subject which is peculiarly touching to my feelings; and I scarcely dare trust myself to dwell upon it at any length. (Here the President was evidently much affected.) I will only venture to say, that I feel very grateful for the kindnesses I have always received from the various members of this Society, from the time I became a member of it down to the present day; and that I trust that, in the performance of my duties as President, I have so regulated the proceedings of our meetings as to have given you all satisfaction, and to have promoted (to a certain extent, at any rate) the objects and interests of the Society. (Loud applause.) In taking my leave of you as your President, allow

me, gentlemen, to repeat a piece of advice which I gave you, when I took this chair, and which I venture again to offer, because I think it most important. It is, again to recommend to each of you to continue to consider, that upon your individual exertions depend very much the future success of this Society. Upon the individual exertions of the members of any society depends very much its success; and a young society like this, embracing a new and comparatively a very limited field of action, as contrasted with most of the existing scientific societies, I feel, requires, on the part of each of its members, constant and arduous exertion, a good deal of self-sacrifice, and a determination to do "each the best that in him lies" to promote its objects. By promoting its objects, we shall promote its interests and its welfare, and advance the interests and the welfare of our profession generally.

I will not detain you longer, gentlemen, but once more beg to thank you for all your kindness. (Loud applause.)

Mr. W. M. BIGG.—I rise to propose a vote of thanks to our esteemed President, who has ever displayed the greatest zeal in the welfare of the Odontological Society. I am satisfied that every gentleman attending our council meetings, and who has had the pleasure of co-operating with our chairman, must have observed the urbanity of manner, the excellent judgment, and aptitude for business, which so pre-eminently qualify him for the position he has so satisfactorily filled. Our President's conduct has ever been characterised by a manly and dignified maintenance of our laws, which must have given general satisfaction. I am sure all will agree with me that Mr. Harrison is entitled to our very best thanks for the constant attention and unremitting labour given to this Society during his year of office.

The resolution was seconded by Mr. Parkinson and carried unanimously.

The PRESIDENT.—I beg to assure you, gentlemen, that I feel very sensibly the kind manner in which Mr. Bigg has proposed this vote of thanks, and the cordial and complimentary way in which his proposition has been met. I can only say that it has afforded me very great pleasure to have given, during my year of office, such attention as I have done to the business and interests of the Society, and that, if I have succeeded in so performing my duties, as to leave the chair possessing as

high a position in your good opinion as I conclude I must have possessed to have caused you to elect me to it, I am fully rewarded for any time and trouble I may have bestowed upon those duties. I beg to add, that it affords me great satisfaction, in leaving the chair, to know I shall be followed by a gentleman who will be able to discharge its duties equally as well as, if not very much better than, I have been able to do.

Mr. SAUNDERS.—I trust you will bear with me one minute, before this meeting is quite brought to a conclusion. While I heartily concur with all that has fallen from Mr. Bigg, I think I may presume that I am only giving form to an unanimous wish of this meeting, and of the Society, when I express a hope that our President, who in his admirable address so gracefully retires from the chair which he has occupied during the past year with so much honour to himself, and with so much advantage to the Society, should follow the example of his predecessors, and favour us with his "counterfeit presentment," to fill this yet unoccupied space (pointing to a blank space on the left of the chair). Without wishing to say anything to the disparagement of those who have gone before, or to the discouragement of those who are to be his successors, I cannot help remarking that we have in him a rare combination of the qualities essential to a good President. He is one of our representative men, and his example should be ever before us. In the regularity of his attendances, both at councils and general meetings, and his punctuality at both—in the patient and impartial manner in which he regulates discussion—in the encouragement he has always given to the expression of opinion to every member alike—in the admirable manner in which, by an occasional judicious remark, he elicits and maintains discussion—in his knowledge of law and the details of society business, by which he is enabled to correct our wanderings, and to keep us straight—in all these respects he is pre-eminent; and though there is no fear of our forgetting him, or of his not being personally present with us, it would, I am sure, be a great gratification to us all to see his portrait adorning these walls.

The PRESIDENT.—I really think, gentlemen, that it is time I left this chair, or I shall be overpowered by the kind remarks of my friends. I have much pleasure in saying, however, in answer to Mr. Saunders (while I at the same time beg to thank him for the very kind way in

which he has just spoken of me), that I shall be exceedingly happy to fall in with his proposition, if it is the wish of the Society that I should do so. I should feel it a high compliment to have my portrait suspended in this room by the side of those which I see around me; and, as such appears to be your wish, I will take an early opportunity, when I am a little recruited from some harassing business I have lately been passing through, to get myself transferred to canvas, and place myself in that form at the disposal of the Society. (Cheers.)

The Society then adjourned.

[We are authorised to announce that, at the next meeting, Mr. Cartwright will read a paper "On Disease of the Pulp dependent on Dental Caries."—ED.]

JOURNAL INDEMNITY FUND.

SEVERAL members of the profession having expressed a desire to raise a fund towards liquidating the expenses incurred in the trial, *Morrison v. Churchill*, the undersigned gentlemen have formed themselves into a committee for that purpose. Feeling strongly that it was not so much an individual as a principle that was attacked in the alleged libel, they invite the co-operation of any of their professional brethren who may be willing to add their names to the committee, and request them to communicate with the Honorary Secretary, 17, New Burlington Street.

It has been thought desirable that subscriptions for the above purpose should not exceed one guinea, which may be forwarded to the Treasurer, 30, Cavendish Square, the Honorary Secretary, or any member of the committee.

THOMAS BELL, F.R.S.

H. J. BARRETT.

C. SPENCE BATE, Plymouth.
CHARLES BROMLEY, Southampton.
S. CARTWRIGHT, F.R.S.
ALFRED CANTON.
W. A. N. CATTLIN.
J. DREW.
C. W. DUNN, Florence.
J. B. FLETCHER.
OCTAVIUS A. FOX, Brighton.
S. GHRIMES.
R. HEPBURN.
THOS. H. HARDING.
ALFRED HILL.
G. A. IBBETSON.
GEORGE LAURIE.
M. MAGOR, Penzance.
JOHN MARTIN, Portsmouth.
J. B. MUMMERY.
R. NASMYTH, Edinburgh.
Dr. P. ORPHOOT, M.D., Edinburgh.
JAMES PARKINSON.
G. T. PARKINSON, Bath.
ARNOLD ROGERS.
FREDERICK ROGERS.
CHARLES ROGERS.
ALFRED ROGERS, Manchester.
W. D. SAUNDER.
E. SERCOMBE.
J. SHEFFIELD.
N. STEVENSON.
THOMAS UNDERWOOD.
BURNLEY WALKINSHAW.

G. A. IBBETSON, *Treasurer*.

J. B. FLETCHER, *Hon. Sec.*

* * The committee will hold a special meeting at 32, Soho Square, on Monday the 28th instant, at 5 o'clock, and suggest to those gentlemen wishing to subscribe to the fund that they should send in the amount to the treasurer as early as possible, as the committee contemplate shortly closing the list.

Post-Office Orders should be made payable at Vere Street, Cavendish Square.

The Month: Miscellaneous and Scientific Intelligence.

NEW ZEALAND STEEL.—Ever since the settlement of New Zealand by Europeans their attention has been daily called to the peculiarities of a kind of metallic sand along the shores of New Plymouth, in Taranaki. This sand has the appearance of fine steel filing, and if a magnet be dropped upon it,

and taken up again, the instrument will be found thickly coated with the iron granules. The place where the sand abounds is along the base of Mount Egmont, an extinct volcano, and the deposit extends several miles along the coast, to the depth of many feet, and having a corresponding breadth. The

geological supposition is that this granulated metal has been thrown out of the volcano along the base of which it rests into the sea, and there pulverized. It has been looked upon for a long time as a geological curiosity, even to the extent of trying to smelt some of it; but, although so many years have passed since its discovery, it is only recently that any attempt has been made to turn it to a practical account; in fact, the quantity is so large that people out there looked upon it as utterly valueless. It formed a standing complaint in the letters of all emigrants that when the sea-breeze was a little up they were obliged to wear veils to prevent being blinded by the fine sand which stretched for miles along the shore. Captain Morshhead, a gentleman in the West of England, was so much impressed with its value that he went to New Zealand to verify the reports made to him in this country, and was fortunate enough to find them all correct. He smelted the ore first in a crucible, and subsequently in a furnace; the results were so satisfactory that he immediately obtained the necessary grant of the sand from the Government, and returned to England with several tons for more conclusive experiment. It has been carefully analysed in this country by several well-known metallurgists, and has been pronounced to be the purest ore at present known; it contains 88.45 of peroxide of iron, 11.43 of oxide of titanium, with silica, and only 12 of waste, in 100 parts. Taking the sand as it lies on the beach and smelting it, the produce is 61 per cent. of iron of the very finest quality; and, again, if this sand be subjected to what is called the cementation process, the result is a tough, first-class steel, which, in its properties, seems to surpass any other description of that metal at present known. The investigations of metallurgical science have found that if titanium is mixed with iron the character of the steel is materially improved; but, titanium being a scarce ore, such a mixture is too expensive for ordinary purposes. Here, however, nature has stepped in and made free gift of both metals on the largest scale. To give some idea of the fineness of this beautiful sand, it will be enough to say that it passes readily through a gauze sieve of 4,900 holes or interstices to the square inch. As soon as it was turned into steel by Mr. Musket, of Coleford, Messrs. Moseley, the eminent cutlery and toolmakers of New-street, Covent-garden, were requested to see what could be done with the Taranaki steel. They have

tested it in every possible way, and tried its temper to the utmost, and they say the manner in which the metal has passed through their trial goes far beyond anything that they ever worked in steel before. It has been formed into razors, scissors, saws, pen-knives, table cutlery, surgical instruments, &c., and the closeness of the grain, the fineness of polish, and keenness of edge place it in the very foremost rank—almost in the position of a new metal. Some silk-cutting tools have been made, and so admirably have they turned out, that one particular firm will in future have no others. In the surgical instruments the edges have been examined by the microscope, and have stood the test in keeping the superiority. A number of gentlemen interested in such matters have called at Messrs. Moseley's and have taken various articles of this steel away for the purpose of trying it. It is stated to possess peculiar advantages for gun-barrels and boring-cutters for ordnance purposes. As far as is at present known of this extraordinary metal, it bids fair to claim all the finer classes of cutlery and edge-tool instruments to itself, so well has everything made from it turned out. Messrs. Moseley, in whose hands the sole manufacture of cutlery and edge-tools is vested for this country, have placed a case, filled with the metal in all its stages, in the Polytechnic Institution. There is the fine metallic sand, some beautiful specimens of the cutlery made from it, and the intermediate phases of the iron and steel. An official experiment is expected to be made at some of the Government establishments shortly, and it is also intended to forge some chain cables, anchors, &c., in order to fully set forth the great superiority of the Taranaki iron.—*The Australian Mail.*

BOOKS RECEIVED.

'American Journal of Dental Science,' Oct., 1860.

To Correspondents.

NOTICE.

Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.

Communications have been received from Messrs. Charles William Dunn, Florence; John Evans; Lawrence Vanderpant; J. Hearder, Plymouth; J. Walker; A. Stewart; X. Y. Z.; G. A. Ibbetson; J. B. Fletcher; W. Ford; C. A. Rodway; J. L. Statham.

British Journal of Dental Science.

No. 56.

LONDON, FEBRUARY, 1861.

VOL. IV.

Hospital Reports and Case-Book.

ULCERATION OF THE TONGUE.

To the Editor of the 'British Journal of Dental Science.'

SIR,—The subject of ulceration of the tongue is one of some importance to dentists, because it not unfrequently arises from the irritation produced by the sharp edge of a decayed tooth; and sometimes the cure is obstinate. A case of the kind recently came under my notice, of which the following are a few of the particulars:—Mrs. M—, residing at Wanstead, consulted me about her tongue, which had a deep and excavated ulcer at its left side, into which I could almost put my little finger. This had been caused by the rough edge of a molar tooth, which had, in the first instance, produced irritation, and then an ulcer, which continued to increase until it had attained the size mentioned. There was, moreover, an unhealthy secretion from its surface. I freely applied the nitrate of silver to the ulcer, first filing the roughened edge of the tooth until it was perfectly smooth, and ordered my patient to use the following lotion frequently during the day, with directions to apply it on a piece of lint well inserted into the depths of the wound; namely, a scruple of sulphate of copper, four scruples of sulphate of zinc, and two drachms of tincture of opium, in eight ounces of rose-water. I at the same time prescribed a mixture, consisting of an

ounce of sulphate of magnesia, ten grains of disulphate of quinine, half an ounce of syrup of ginger, and seven ounces and a half of the compound infusion of roses; two tablespoonfuls to be taken every morning. Under this treatment the ulcer gradually contracted and became healed, remaining so for upwards of twelve months.

About three months ago, my patient again called upon me, and stated that her tongue was as bad as it was before, only that the ulceration was not so deep. I treated it in the same manner as on the first occasion, and applied the nitrate of silver more frequently, but it did not seem to afford the relief that I expected it would. I therefore ordered a lotion of a drachm of the chlorate of potash in six ounces of water, to be applied frequently during the day; and a mixture containing four scruples of the iodide of potassium, and the same quantity of the ammonio-citrate of iron, in eight ounces of water; a tablespoonful to be taken three times a day, in a wineglass of water. Under this plan of treatment she rapidly improved; the ulcer healed very quickly indeed, and she has remained perfectly well since.

I am, Sir,

Your obedient servant,

THOS. H. HARDING,

D.L.R.C.S.

19, Park Square, Regent's Park.

British Journal of Dental Science.

LONDON, FEBRUARY, 1861.

"It is a maxim in the practice of certain lawyers, that when you have no case you must abuse your adversary: in other words, you must endeavour to distract the minds of the judge and the jury from the real question before them, and so prejudice them, not against the cause at issue, but against the parties who represent that cause, that they are led to condemn the one on account of their feelings towards the other."

THUS writes a correspondent in the February number of the 'Dental Review,' and in the earnest endeavour to prove that such has been our line of conduct, both he and the editor, in a leader on ours of last month, unhappily fall into the very error they denounce. Indeed, both letter and leader, if not penned by the same hand, partake so strongly of the same spirit, that we shall (although the course is unusual) comment upon them both together.

That our readers may form some conception of the style usually adopted by the 'political' writers in the 'Dental Review,' and judge whether the line "*Mutato nomine de te fabula narratur*" may not be aptly applied to them, we select a few of the elegant expressions with which the two articles in question are adorned. These writers seem literally to revel in such phrases as "violent and unscrupulous productions"—"mendacious assertions"—"libellous and scurrilous attacks"—"foul personal abuse"—"a dog returning to its vomit"—"disappointed and malignant spirit"—"old style of personal slander"—"atrocious calumny"—"vulgar bullying," &c.

We admit that such a torrent of hard words is enough to distract the minds of any tribunal from the real question before

it, and to prejudice it, but we humbly conceive that the prejudice in this case should be not against ourselves, but rather against those, who evince such ludicrous emotions of anger at the appearance of an article asserting such undeniable facts that it is impossible to refute them; indeed, the attempt is not even made, but at the very moment when our opponents are seeking to accuse us of wandering from the point, they do so themselves, by the mistaken assertion that "the question at issue is whether there should be an independent dental profession, or whether it should be a mere fragment of the College of Surgeons."

If the readers of the 'Dental Review' will take the trouble to turn to the article in our January number, which has so painfully affected the denizens of 5, Cavendish Square, they will see that the point we there discuss is the truth, or not, of the assertion, that the PROFESSION is in a divided state; and, in pursuance of our argument, we assume that we have, on the one side, the profession, represented by the Dental Licentiates of the Royal College of Surgeons, and the Odontological Society; and on the other, the College of Dentists (whose followers we analyse); with intermediately, a body of men, unconnected with either, whom, as a mass, we cannot consider strictly as *professional* men, but whose names, nevertheless, may be found in any published Directory, under the head of "Dentists," "Chemists and Dentists," &c., &c.; and that, we further stated, that we could not look upon the College of Dentists as *representing* the profession, or even a

hundredth part of it, for the reasons we then gave. Even the editor of the 'Dental Review' admits that, "interpreted according to the rules of logic, the obnoxious passage in which certain dentists are accused of being barbers, blacksmiths, chemists, and photographers, refers to some mythical list of dentists." Why, then, should he have gone out of his way to assume that it is intended to apply to the College of Dentists, and have allowed his logical acumen to become so far obscured as to cause him to put on the cap, which, on *this occasion*, at any rate, was not meant for him, or his party.

There is an old French saying, *Qui s'accuse s'accuse*, and we think the advocates of the College of Dentists would do well, for their own sakes, to bear this a little

more constantly in mind, and not rush so readily and so wildly at all times to the rescue; this sensitiveness drives us to suspect that "the lady doth protest too much," and to fear that their list will hardly bear even so gentle a criticism as we bestowed upon it.

We have thought it right to say so much in self-defence—although it is, perhaps, questionable whether our illogical contemporary deserves so much notice from us—lest his observations remaining unanswered might give rise in the minds of some of our readers to the idea that we admitted the justice of them. We are by no means sure, however, that the time and space occupied by these remarks might not have been better bestowed, and should our readers think so, we beg to apologise to them.

Dental News and Critical Reports.

THE ODONTOLOGICAL SOCIETY.

THE MONTHLY MEETING of the Members of this Society took place at the Society's Rooms, 52, Soho Square, on Monday evening, the 4th February, 1861.

WILLIAM MINSHULL BIGG, Esq., President, having taken the chair for the first time, said—

GENTLEMEN,—Permit me to return you my sincere thanks for appointing me to the important post I now hold. In electing your president, you confer the highest honour this Society can bestow on its members. I am fully sensible of the compliment you have paid me, and earnestly hope I may be able (with your aid and support) to discharge the duties and obligations which devolve on me. When I consider the aptitude for business displayed by my predecessor during his tenure of office, I confess I have very many misgivings as to my competency; nevertheless, it will ever be my desire to uphold the dignity of this Society, not forgetting the objects for which

it was instituted—namely, the encouragement of free discussion on the various cases of interest which may come under our notice in the daily practice of our profession; and, by the reading of papers that may promote discussion, and elicit information which may be useful and profitable to us all. After the careful *résumé* of the transactions of last year, given so lucidly by our late president at the last general meeting, it would be supererogation for me to recapitulate matters you are all so well acquainted with. There can be no doubt that this Society is progressing most steadily and satisfactorily, increasing year by year its influence and number of members. I will venture to hope this progress will never be retarded, so long as I see around me gentlemen who are so well qualified to furnish us with communications of general interest. I will detain you no longer. Allow me again to thank you for the honour you have done me.

The minutes of the last meeting having been read and approved,

The PRESIDENT announced the following contributions to the museum.—A curious set of artificial teeth of the last generation; Models of a case of partial dentition, presented by George Owen, Esq., Islington; A collection of skulls of various animals, presented by Nathaniel Stevenson, Esq.

The PRESIDENT remarked that it would much facilitate the proper announcement of gifts to the Society, if contributors would, in each case, furnish a list of the various articles they presented.

Messrs. George Laurie, D.D.S., 26, Mortimer Street, Cavendish Square, and Samuel Parker, Cannon Row, Birmingham, were then announced as candidates for election as members of the Society.

Mr. COLEMAN.—I have here a very interesting specimen of what I believe to be an upper incisor tooth, but of a very abnormal shape, insomuch that I refrain from making any comments upon it, and simply exhibit it to the meeting. It was given to me by Mr. Evans (one of the house-surgeons to St. Bartholomew's Hospital), and was removed from a child of about twelve years of age, from the upper jaw, in consequence of its projecting against the upper lip, and causing ulceration.

Mr. CARTWRIGHT then read the following paper:

On Disease and Treatment of the Pulp.

A PAPER was read by Mr. Thomas Rogers on the first occasion of the meeting of this Society in this present session, written by Mr. Bellasario, of Sidney, on the advisability of drilling into the pulp-cavity at the necks of teeth for the purpose of relieving the pressure of fluid secreted during ulceration or decomposition of the pulp-substance, or the inflammatory condition which so often succeeds when teeth have been plugged over exposed pulps. As the subject excited considerable interest, I wrote the present paper partly because I heard that no other paper had been forwarded to the Secretaries to be read at the second meeting of the Society, but principally for the sake of renewing discussion upon a point of much practical importance; but I found that one had been promised by Mr. Coleman, which I regret I did not have the pleasure to hear, but as that paper did not go into the subject of diseased pulps generally, I submit the present as then written, but with some additions, to the Society, and trust that in so doing I shall not be con-

sidered as intruding an oft-repeated tale on their attention. I have no idea of offering matter new to the profession, and have not confined my remarks to the late Dr. Hullahen's operation, but have considered the subject of diseased pulps generally, and the treatment which, from my own observation and experience, as well as such recorded by others, appears to be most likely to save the pulp, and failing that to save the tooth.

It is not necessary to take up your time in going into the anatomy and physiology of the organ under consideration, but in order to make clear what I have to say, I will touch on those subjects so far as is necessary to assist demonstration. The pulp is a soft pale-pinkish substance, containing cells and their nuclei fully supplied with vessels and nerves, and surrounded by a basement membrane which fulfils the office of a periosteum. It is generally adherent to the walls of the cavity in which it is encased, and appears to be, according to Mr. Tomes's researches, continued in the form of minute fibrils into the dentinal tubes; but it is especially adherent at the upper part of the cavity at the crescentic convex borders, and presents at the terminal points of the crescentic edges a character prolonged and dense as to assume the office of ligaments, and which hold the pulp in position. It requires some force to tear the pulp from these points, so firmly is it attached.

Under circumstance of irritation or by a gradual process during the course of years, the pulp becomes wholly or partially converted into what is termed secondary dentine by Mr. Tomes, osteo-dentine by Mr. Owen, and which in old age, or sometimes under peculiar circumstances in comparatively early age, completely usurps the place of the pulp and fills up the pulp-cavity. This secondary dentine does not present itself in any regular manner, but is found in patches or points of ossification throughout the pulp-substance. Mr. Salter calls these patches "islands." These points increase in size and join other patches, but often a considerable quantity of pulp remains between, and in dried specimens these patches appear isolated in different parts of the thickened pulp-substance. In caries and in teeth which are worn away by friction, exposing or threatening to expose the pulp-cavity, this secondary dentine forms readily at the point encroached upon.

The form of the pulp differs in different classes of teeth; in single-fanged teeth it is

long and narrow, having tapering extremities; but in bi-fanged teeth and multi-fanged teeth it is broad and somewhat square-shaped at the upper part, which corresponds with the crown and neck, and tapers down to the extremity of the roots. The pulp-cavities coincide in configuration with the pulps. In the upper bicuspids and molars, and the lower molars, the cavity forms an irregular square, the upper border or roof, if I may so express it, being very convex; so that the superior margins of the four walls are crescentic, and consequently four sharp corners are formed at the points of union of the crescentic edges. Now these crescentic points are those prominent parts which are most liable to be exposed in the process of excavating decayed cavities, both when decay exists in interstitial situations, and when it takes place on the masticating surfaces of teeth. On the molars, for instance, decay is found usually in two situations; in the depression in the centre of the crown, and in the posterior fissure, which is situate over the posterior crescentic points of the pulp-cavity. The former situation admits of deep excavation on account of the convexity of the roof of the cavity, whilst in the latter the points may be reached more readily, and in some teeth without any great depth of cavity being made. The same remarks apply to the anterior and posterior approximal cavities in these teeth. The crescentic points are liable to be exposed when excavating the sides of the cavities.

We know that the pulp may be removed from a tooth, and the tooth may be plugged and retain its colour, but the sense of pain is destroyed, and vitality may be preserved in the root or roots through the vascular medium of the periodontum. We also know that a tooth may become gradually discoloured after the pulp is destroyed, and yet remain painless; but if inflammation set in so as to destroy the periodontum and periosteum of the socket, then the tooth is always troublesome, either owing to inflammatory symptoms or a necrosed condition of the walls of the socket, or from the irritation consequent on the contact of a non-vital organ with a vital one. We may reasonably infer that nervous sensation is communicated to the tooth by means of the pulp, and that the vascular supply is furnished to the crown of the tooth through the agency of the pulp, but that the vitality of the root or roots is preserved, independently of the pulp, by the vascular supply

through the periodontum which is furnished by the alveolar arteries. Roots will retain vitality and go on increasing in size by deposition of cemental substance long after the crown has been lost through caries.

The pulp may be affected in three ways without manifesting symptoms of inflammation; irritatively, but without contact with decayed bone, probably by infiltration or nervous communication through the organised contents of the dentinal tubes; irritatively, but in contact with decayed bone; and irritatively from positive exposure to external influences.

I have known cases of irritation of the pulp where only superficial decay existed, but where there was experienced severe pain, simulating violent toothache arising from acute inflammation. In two cases which I call to mind the pain was so severe, that the patient called with the idea of losing the teeth; the affected teeth were a bicuspid and a molar, both of the upper jaw, the decay interstitial. In one case the decaying bone did not exhibit any extraordinary sensibility; in the other, the dentine was very sensitive on touch. The removal of the decayed bone in the least sensitive tooth, the molar, and the partial removal of the decay in the other, followed by the application of morphia, protected by a pledget of cotton wool dipped in mastiche solution for a few hours, removed the pain, and the teeth were plugged with gold-leaf without trouble on the following day, and have remained free from pain. It is by no means unfrequent to meet with long-standing decay, especially in the denser kind of dentine, where pain and evident irritation exists in the pulp-substance, often evidenced by irritable sensation rather than defined pain, and these cases are mostly amenable to treatment; or in other words we may induce, by stimulative applications, those conditions which not unfrequently spontaneously occur; for where decay is gradual, and the affected bone hard and dry, it is not uncommon to find the pulp partially, if not altogether, ossified; at all events, the dentine immediately covering the cavity, although dark, will be found excessively hard and the probability is that the ossification of the contents of the tubes, which appears to account for this density, is coincident with calcification of the pulp; as soon as the surface exposed is covered by a plug, the irritation subsides.

Where irritation exists, the result of contact of decayed and soft bone with the

pulp, pain is the result of the pressure of air or food, the effects of cold or heat, or of acrid secretions, either of the mucous membrane, or more generally and probably the acidity arising from stagnant mucous secretion retained in the cavity of decay and infiltrating through the spongy bone, or the decomposition of animal substance taken as food, &c. In such cases it is not desirable to attempt the removal of the whole of the decayed bone—a proceeding which would of necessity expose the pulp; but the upper part of the cavity may be cleared out, freeing the walls thoroughly, and leaving intact the soft bone which lies over the pulp cavity; and, after thoroughly drying, a fairly compact filling may be made with tin, or gold even—Hills' or Jacobs' stopping, either with or without a cap, as the case may be. The exclusion of air and moisture speedily relieves the symptoms of irritation, and, after the lapse of months or a year, the temporary filling may be removed, more decayed bone taken away from the floor of the cavity without painful sensation, and the tooth properly and safely refilled. In most cases it will be found that decay has made little if any progress during the probationary period, and often, instead of being soft, moist, and flaky, it will be firm and dry; and this condition is doubtless more likely to be constant if, previously to the temporary filling, a small quantity of tannin is inserted. When much sensation exists in the affected bone, and when the slightest pressure is unbearable, then the application of morphia, alone or combined with sal volatile or spirits of wine, morphia and creosote or oil of cloves, sulphate of atropine, tannin and creosote, sulphuric or nitric ether, or chloride of zinc, and Mr. Drew's compound, consisting of quicklime and magnesian limestone (introduced to the notice of the Society at a former meeting), act beneficially in allaying both the extreme sensitiveness of the dentine and irritability of the pulp. Tannin has doubtless the effect of hardening the decomposed bone by combining with the animal tissue, or, more properly speaking, through the affinity which gelatine has for tannic acid. Not unfrequently patients are their own doctors, and persons suffering from severe toothache fly to that unpleasant column of the 'Times' advertisement sheet, where cure for toothache is promised in an instant, and send for the bewitching mineral succedaneum "known only to the advertiser," and which, immediately on receipt,

they apply according to direction: they insert the magic filling recklessly, of the physiology of nerves and pulps possessing happy ignorance, in the midst of decayed bone and even over partially exposed pulp, and often, strange as it may appear, without those results which so often harass the practitioner and puzzle his ingenuity. The reason of the success is easily solved: the pulp, although exposed, is not inflamed; the non-removal of decayed bone protects the pulp from immediate contact with the filling, and the patient goes free, for a time at least, rejoicing in and singing the praise of the mineral compound. I have found, on removing this amateur filling in certain cases, either for the purpose of refilling properly, or because it had become loose after remaining in for periods ranging from weeks to a year, that little sensation existed, and have removed decay and filled the cavity without causing pain, the pulp having been either removed by painless ulceration, or comparatively so, or partial ossification having taken place in its substance. I have referred to these cases because they innocently confirm the value of our practice of temporarily filling tender teeth, for the purpose of giving nature time to provide against the encroachment of decay by pulp calcification, or to arrest the progress of decay by excluding air and moisture, or to allow of the obliteration by deposit of ossific matter within the affected tubular structure—a physiological fact so clearly and correctly demonstrated by Mr. Tomes.

There can be no doubt that teeth which present generally sound and dense structural development, and in persons of robust constitutional diathesis, the pulp calcifies more readily than in others whose teeth are more delicately organized, and whose constitutional powers are less vigorous and healthy. Teeth which are gradually worn down, exposing the *cavità pulpæ* with its ossified pulp, we find, as would be expected, they are in structure dense and of that pale yellow colour which characterises good strong teeth. The jaws and oral cavity coincide with the teeth—being, as it is termed, well pronounced—well arched and wide, the external and internal plates of the lower maxilla thick, and the cancellous structure dense, as in the Celts, or elliptical and deep, as in the Scotch and north-country people.

The teeth, too, of those persons which are worn away by pressure of the pipe, retained by habit between the same teeth, are always of good quality, the enamel

thick, and the dentine dense. We never find delicate-structured teeth worn away with ossified pulp-substance showing or the circular opening where the pipe is carried, in mouths the teeth of which are delicate. Absorption of the alveolar cavities takes place from the pressure of the opposed teeth in the one case, and the pipe is shifted about in the mouth in the other, on account of the uneasiness produced if it be retained too long in one spot.

These facts lead to the conclusion that teeth presenting good structural features, and which belong to a sound constitutional diathesis, are more likely to be treated successfully if decayed, and if decay have progressed so far as to implicate the pulp; but that others in which structural formation is indifferent, and the general condition of the system shows want of tone and power, the chances of inducing by local treatment the calcifying of the pulp is very problematical. Passive or active irritation in neighbouring structures will induce cemental increase and likewise pulp calcification, and in many instances we find the two phenomena co-exist, as may be proved by splitting or sawing through teeth which present abnormal thickening of cement substance. A certain amount of irritation appears to be necessary to induce the pulp to ossify prematurely, which irritation may arise from some physiological condition of the teeth themselves, or from disease of the tissues or bone of the jaws. But this subject is pregnant with interest, and will admit of still further investigation, although the researches of Mr. Salter and Mr. Tomes have gone far to elucidate it. As far as a single illustration is admissible, the latter phenomenon is shown in a specimen on the table—a *longitudinal section of a lower anterior molar tooth*, which I removed from a diseased jaw previous to operation, and to which I referred on the occasion of Mr. Bellisario's paper being read. You will see that cemental substance is largely developed, and secondary dentine occupies the entire pulp-cavity. The tooth was situated in bone much influenced by the disease of the gum tissue, which turned out to be fibrous tumour. The two bicuspids, which I also removed, were out of the sphere of the disease, and were normal in regard to their roots and pulps. Some four or five years ago I filled a lower molar tooth for a young lady about twenty-two years of age. (The preparation is on the table.) It had been tender, but there existed neither looseness nor sign of in-

flammatory action. Excavating the decayed bone was painful; but the pulp-cavity I know was not reached. The tooth, when filled, was perfectly easy; and since that time I filled two other cavities. She married, and, as is common, suffered much from neuralgic pains in the teeth and face during pregnancy. I may add, too, that she was subject for some years to true neuralgic affection—the result of a violent concussion of the face with the side of a carriage which was overturned, the horse having run away—and is somewhat hysterical. About nine months ago she suffered severely from lancinating and throbbing pain, and the posterior molar tooth, left side, was loose and sensitive on striking with steel; it had been some months previously filled with Hill's stopping on the masticating surface, the bone being peculiarly sensitive, but the pulp-cavity was not reached by decay. I removed the tooth at length, at her repeated and urgent request, and found the pulp healthy in appearance, though somewhat larger than normal, and slightly congested. After the first day she lost all pain. About three months ago she had a severe attack of sharp, lancinating, diffuse, and throbbing pain. The tooth which I first referred to, the anterior molar, became loose and tender, and there was some sympathetic swelling. Soon the pain subsided, and the tooth became firm. Nine weeks ago she had a similar, though more aggravated, attack, accompanied by similar symptoms. Two months back I removed the tooth, and, on dividing it with a saw, I found that the pulp was three parts or more ossified, with one piece of irregular and several isolated nodules of secondary dentine; the cavity and canals of the roots were filled with thick and offensive fluid, the residue of the decomposed remnant of the pulp. There was, you will see, no communication between the decayed cavity and the *cavitas pulpæ*. It is manifest that the pulp had been long diseased; but it is a curious fact, considering the condition of the pulp, that four years or more should have passed without pain being felt in the tooth. I have now no doubt that drilling into the pulp-cavity at the neck of the tooth would have relieved the symptoms, for three weeks ago this same lady suddenly suffered from severe lancinating, darting pains in the upper right anterior molar, which had been filled for some time, and which, up to that time, had been perfectly easy. There was no external appearance of inflammation, but the nature of pain indicated pulp

irritation. I may state that I ascertained she was with child. I did not in this case remove the tooth, although she much wished it, but drilled into the pulp-cavity. She suffered for ten minutes most intense pain, which satisfied me that acute inflammation existed in the organ; but the tooth was free from sensation on the following day, and has remained so since.

The difficulty heretofore and generally experienced in treating diseased or exposed pulps has been naturally great, and often all our efforts are unavailing. The delicate organization of the substance, and the unyielding nature of the structure which encases it, render the mutations from irritation to inflammation, and inflammation to ulceration and gangrene, so rapid that local applications have not much chance; whilst temperament and constitutional tendency often render treatment nugatory. Despairing therefore of saving the pulp, and vexed by frequent disappointments, practitioners have adopted the total destruction of the pulp, either by removal by instrument or by the use of escharotics; the feasibility or rationale of the plan being warranted by the vascular connexion which exists between the periosteum of the alveolar and the periodontal membrane.

(I have brought with me a specimen which shows a vascular connection through the tooth substance with the pulp itself—a connexion which I expect is not unfrequent. And since writing this I have read a paper by Mr. Mc Quillen in the 'Dental Cosmos' which mentions cases of vascular permeation of the cement and dentine, and the communication which exists between the periodontum and the pulp. But unless the whole of the pulp be removed, or the remnant remaining in the root be allowed to heal so that no secretion is formed, or to become removed by ulceration, it is useless to fill the cavity solidly. The secretion formed, either in the shape of pus or fluid, by the remnant of the ulcerated or decomposing pulp will, as is well known, by pressure induce inflammation of the periodontal membrane, or having no outlet excepting by the small opening at the extremity of the root or roots, the fluid becomes but gradually infiltrated between the root itself and the periodontal membrane, inducing a train of symptoms which terminate what is called alveolar abscess.

If we can get rid of the remnant of pulp situated at the lower portion of the canal in the fang and all secretion before the periodontum has become implicated by disease,

the cavity of decay may be filled together with the entire cavity in the root, and sometimes of a portion of one or more of the multi-fanged roots of the molars, and success repay time and trouble. I cannot bring myself to believe in the possibility of completely filling up the whole of the three roots of a molar tooth.

It is a question still as to the time expedient to elapse before attempting to fill after the pulp's artificial destruction, and in this we can only be guided by circumstances. Persons in good health, and of phlegmatic temperaments, are more easily manageable as respects operative treatment on their teeth, than delicate persons or persons of irritable temperament. I have more than once filled over an opening into the pulp-cavity, made during excavating (when the crescentic edge of the cavity is prominent), without untoward results, knowing my patient, but to adopt a practice generally founded on an occasional successful issue in such cases, would subject one to continual disappointment and patients to grievous pain and probably loss of teeth. Some of the most permanently successful cases which I have had, have been those in which I have allowed ample time to elapse between the period of destroying the pulp and the insertion of the permanent filling; the time varying from two to six and eight months. With me, too, the treatment of upper molar teeth (I mean, when roots have to be filled as far as possible, as well as the cavities in the crowns) has been more successful than lower molars, and as would be expected, single-fanged teeth than bi- or tri-fanged teeth. I attribute this to the difference of density of the two maxillæ, whereby absorption of the alveolar parietes more readily takes place in the superior maxillæ than in the thick plates of the inferior bone. Teeth will often answer well when filled on the day following that on which arsenic has been applied. I saw, not long ago, a gentleman for whom I destroyed the exposed portion of the pulp of a lower molar tooth, and filled it with gold on the following day, now some nine years back. He has not experienced the least annoyance from the time it was done; for the last year or so it has been loosening, probably from absorption of the alveoli or of the fangs, but is still quite serviceable, and he was not aware that it was loose.

Of all the escharotic agents used for destroying the pulp-substance, there is none that seems to answer so well as arsenic, either used alone, or in combination with

essential oils—creosote or oil of cloves—and morphia; but other substances are used, such as chloride of zinc, hydrate of potassa, mineral acids, sulphate of copper, perchloride of iron, nitrate of silver; cobalt which I have not used, but which is strongly advocated by Mr. Arthur, on account of its containing arsenic in great quantity—some 60 per cent.—and its insoluble nature; and the actual cautery, much used abroad, and when the wire can be applied with facility, its application is very satisfactory; I have so treated teeth in my own practice with much success; and having seen many in which the plan has answered well: and the cautery by galvanic action, introduced into surgical practice by Mr. John Marshall, of University College Hospital, used with success, and highly spoken of by Mr. Harding. The pulp may be partially or wholly removed; but when partially so, there is danger of subsequent irritation after filling. The entire pulp may be removed, either by re-applications of caustic or the use of the nerve-drill, or the passive treatment—that which allows time to effect the gradual removal of the pulp—remains, assisted by the application of alcoholic mixtures and sedatives. In single-fanged teeth, the pulp may often be removed entire by means of a twisted or barbed drill; and these teeth, when filled up solidly throughout the length or the greater part of their canals, succeed most perfectly, on the same principle as pivoted cases succeed so well, the vascular connection with the alveolus preserving the vitality of the roots for years. In many cases of exposed pulp, or pulps exposed during excavating, it is not possible, owing to the situation of the decayed cavity in interstitial situations, for instance, at the neck of teeth, to apply the drill or even to reintroduce escharotics so as to lie in contact with the pulp; take bicuspidæ or molares, for instance, the crowns of which are large, and the necks constricted. These cases admit of the Hüllihen operation of trephining or drilling into the pulp-cavities. Dr. Hüllihen performed the operation at the time of filling a cavity in which the pulp was exposed, not previously attempting to destroy it by arsenic or otherwise. He filled over the pulp, opening into it immediately before filling at the neck, just below the level of the gum, or through the gum and alveolus, and so afforded relief by bleeding, or got rid of the pressure of fluid exuded in the inflammatory stage if it set in; but his object was to avoid the risk of inflam-

mation and destruction of the pulp. Drilling into the pulp, when inflammatory action or decomposition has set in, is for a purpose different from Dr. Hüllihen's object: his was to save the pulp; the latter relieves pressure by affording an outlet for pent-up matter, after the pulp is compromised, and so saves the periodontum from being involved in inflammation and suppuration. For the same object, contrivances have been made, and Mr. Barrett is in the habit of using, or did use, a tube with a piece of gold plate soldered to one end, and which was placed over the opening into the pulp-cavity; he then filled over this shield and around the tube, so that an artificial opening was formed for the escape of fluid; or the simple drilling through the filling often answers in like manner. I have for some time past, previous to filling, especially in teeth where the bulk of the pulps are destroyed, but in which moisture or fluid passes up the canals, inserted in the canal, or one of the canals depending on the class of tooth, a piece of gold wire or a broach reduced in temper, and filled round it with amalgam filling, and then removed the wire or broach, leaving a free but small canal for escape of fluid, and the plan answered very well; but I think the drilling at the neck on a level or just under the gum, which is effected by pushing its edge down with the drill previous to rotation, is a neater way of ensuring the same end, and has the advantage of not interfering with making a perfect filling. The plan of capping over exposed pulps with gold, lead, ivory, and other non-conducting substances, without attempting previous partial destruction, is advocated by many practitioners, and is successful in a sufficient number of cases to warrant its adoption; but it is a useless proceeding, if inflammation have set in, or if an unhealed eschar be present, or if fluid or pus exude from the pulp's surface. Mr. Thomas Rogers, who has had much experience in such practice, tells me that he believes one fourth of the cases he so treats succeed.

We cannot give too much attention to the consideration of the best and surest means by which the pulp may be preserved; for, I think, we all admit that the preservation of so important an organ is the point to be aimed at; but if the pulp be exposed and inflamed, removal of the whole is necessary; for in the great majority of cases, no amount of pains of the practitioner will in the end save the organ, and my experience of capping in such cases is far from satisfactory.

If decayed bone, as I have said before,

have extended to the pulp, but without exposing it, the portion covering may be left, and the tooth filled, and remain useful for years. Years ago—twenty and more—my father said, "Don't expose the nerve, get out as much decay as you can, and fill the tooth as perfectly as you can, and it will answer." Mr. Arthur states, in his excellent work on 'Treatment of the Pulp,' that he has not always found it necessary to remove all the decomposed bone from a cavity, and that he has found, on removing filling at the end of a year, which he inserted for temporary purposes, that decay had been stationary.

In cases of extreme sensitiveness, when decay has evidently extended to the pulp, and its contact produces irritation and a congested condition of the vessels at the point of contact, tannin, or tannin and creosote, act satisfactorily. I have often filled temporally with the leaf or Hull's stopping over a piece of cotton-wool moistened, but not saturated, with creosote or other essential oil, or spirit of wine, or ether, on which was taken up tannin, and had reason to be satisfied with the results; and when the irritation has subsided, I have removed the temporary stopping, and first inserted a thin layer or coating of amalgam, which, when hardened, I have filled over with gold leaf. I may say that one considerable advantage attends the plan of casing the cavity of decay with amalgam, viz., the facility with which it may be drilled through, should inflammation supervene. I have but lately seen teeth which I treated years ago in that way, and which are still perfectly comfortable, the filling sound, the gold portion not being affected in colour or compactness. In cases such as these we have fair grounds to suppose that calcifying of the pulp will take place, at all events in some. We occasionally meet with teeth in which secondary dentine has formed under the decayed bone of unfilled teeth.

I have referred to a case in which ossification of the pulp partially took place in a tooth when decay had not reached the pulp-cavity, and in which destruction of the remains of the pulp subsequently occurred.

The peculiarity of the pain experienced in that tooth, and in the one previously removed, where evident irritation existed in the pulp, and which, judging from the sequel of the other, I have little doubt would have evidenced a similar train of symptoms had the tooth not been removed, induces me to draw your attention to the subject of calcified pulp, as presenting dis-

tinctive symptoms which may possibly guide us in forming a correct diagnosis of that condition when it is present in an abnormal form, or, in other words, when the age of the patient is not such as ordinarily to exhibit the phenomena of pulp-calcification. Mr. Cattlin called the attention of the Society to this subject at a former meeting, and tells me that lately he has had two well-marked cases occurring in teeth, the pulps of which are perfectly ossified.

There exists often an undefinable sensation not amounting to pain, but very constant in character, in teeth worn down, or in which decay has been arrested naturally, and in which conversion of the whole substance of the pulp into dentine has taken place. Patients describe an itching, irritable sensation, and say that pressure firmly made on the tooth appears to afford relief; no looseness is apparent, and the gums are not swollen or preternaturally red. I remember a case of a gentleman—one out of several—who complained for two years of inconvenience felt in an upper posterior molar. The ossified pulp was exposed. The increase or decrease of sensation was influenced by his state of health, but he was never without the knowledge that he had that tooth, and at last I removed the tooth. There was some abnormal deposition of cement, but not sufficient to account for the sensation. There was, I may remark, no antagonistic tooth; but there was no extrusion of the affected tooth, as is often the case when an opposing tooth is lost. But calcified pulps are very frequently met with when no marked sensation existed in the tooth, and the teeth are removed on account of irritation arising from a thickened condition of the periosteum, or the very abnormal deposition of cemental substance.

When irregular, dark-coloured, nodulated, and isolated patches of secondary dentine exist, the pulp is in many instances diseased, and the termination of such a condition is gangrene and destruction of the bulk of pulp substance. The train of symptoms are specially those of irritation—sharp, darting, jumping, neuralgic, or, as it is often well described, stabbing pain, intensely severe, but not of long duration; and certain peculiar characteristics are present, viz., absence of general inflammatory symptoms, looseness of the tooth, and freedom of, or but slight, sensation on striking with an instrument; but similar symptoms exist when, as occasionally happens, the unex-

posed pulp inflames and becomes gangrenous without previous calcification. Two cases have lately come under my notice bearing on this point, occurring in teeth which had been filled some time, and which had given uneasiness—both upper molars, one being a second, the other a wisdom tooth. Pain came on suddenly, and with severity, during the late severe frost; in the first case the tooth was tender on striking or pushing from side to side, but this was accounted for by recent inflammation of the periodontum. In the other, no periodontal thickening was observable, but the tooth was sensitive on touch. Each of the teeth was filled with amalgam, and the cavities of decay were large. It is possible that, on account of the large surface filled, the pulps were acted on by cold. The situations of the teeth prevented the ready use of the drill, so I removed them. Now, I think we may safely diagnose a gangrenous condition of pulp from the particular train of symptoms, and may surmise as possible an irregular calcification of the pulp; but the question is, whether the severe train of symptoms will be constant in calcified pulps or partial calcification when the rest of the organ is normal as to condition. I am inclined to say that disorganization of the residue of pulp substance must be present, or at all events impendant, before such marked pains are experienced, and possibly the membrane intervening between the primary and secondary dentine may become inflamed, and be the seat of pain.

We must all of us have had occasion to be puzzled and worried by patients returning, after the lapse of a few days or a month, complaining of pain in a tooth which had been filled, after much time and trouble had been bestowed upon it. In former days the practice was to get rid of the difficulty by removing the tooth; now people are not so fond of losing their teeth, and attention on the part of practitioners has been directed to the means of saving teeth which a few years ago would have been considered a hopeless attempt. With patience, and if our patients will have patience and give the necessary time, teeth may be so prepared as to bear filling successfully when much affected by caries; but it is not one out of fifty who will take the trouble to go through the ordeal necessary to accomplish the end—either of inducing by time or stimulants calcification of an exposed pulp, or the cessation of exudation of fluid, if a pulp have been destroyed as

far as is possible. That such can be accomplished when a fair chance is afforded, there can be no doubt; but, with all our endeavours, we cannot, and do not, succeed in all cases.

The published practice of the late Dr. Hullihen has unquestionably opened a path by which we may be led to more satisfactory results, and his practice is well worthy of consideration and imitation. The notion of drilling through fillings, to afford escape of fluid, and of drilling through the healthy bone into the pulp-cavity at a point away from or below the filling, is not new. Mr. Harrison stated, on the occasion of the discussion on Mr. Bellisario's paper, that he had often drilled into the pulp-cavity for the purpose of relieving the pressure of fluid, before Dr. Hullihen published his paper; and my father tells me that many years ago he saw a tooth that had been drilled in a similar manner, and for a similar purpose, by a dentist residing abroad, and that the operation was successful; but it certainly was an operation very rarely performed, and I do not think ever with the object Dr. Hullihen had in view, and not by practitioners at home or abroad at all as a rule; but it is, I believe, a most valuable operation, simple, and one which will be the means of saving much suffering and many a tooth. In cases of periodontal irritation or inflammation succeeding the filling cavities when the pulp has been reached, it enables the practitioner to get over one of the most tiresome difficulties connected with conservative dental surgery, and saves the annoyance of having to remove either filling which has but lately been inserted after long preparatory treatment of the teeth. I have, within the last three or four months, treated numerous teeth in this manner, and in every instance relief within a short time has been afforded. So many cases occur in practice when, from circumstances, it is not possible to undertake a course of treatment which will secure a probably successful filling. Patients often are passing through town, or come up for a day only, and reside so far off that they are indisposed to undertake repeated journeys; or their avocations may be too important for them to give up the required time. Under such circumstances the operation enables us to fill the tooth at once, with a reasonable conviction that after inflammatory action will not take place.

At present I have not found it necessary to stop even with cotton wool, at the time, the drilled opening; and as all the cases which

I have seen, and which had been operated on some considerable time back, were left open, I am not inclined to attempt the filling up the cavity, unless I find, as in Mr. Ballisario's case, that pulp calcification had taken place, especially as no indication of caries presented in any one case. I find a small broach, short enough not to bend, sufficient for the purpose.

As an illustration, I will mention one case. About ten months ago I filled, after treatment by tannin and spirit, an upper anterior molar, for a gentleman, with gold; it had been very painful. Between three and four months back he called, having experienced very sharp pain for two days past, which came on suddenly, and which he attributed to being exposed to cold and damp. The tooth was slightly loose and tender when moved from side to side. I did not remove the filling, which was quite firm and solid, but drilled into the pulp-cavity at the neck of the tooth. He complained of sharp pain as the instrument entered the cavity, but none was felt a few minutes afterwards. This patient was to call if pain were experienced; but I have not seen him since, and I doubt not that he has found relief from the operation. I can bear my testimony to recorded facts that exposed pulp may be filled over, and all the pressure necessary for gold filling applied, without the patient suffering pain, immediately after the operation of risodontrophy, as it is termed, has been performed, when the slightest pressure previously was unbearable.

I fear I have severely tried your patience, but I cannot conclude without acknowledging Mr. Catlin's kindness in supplying me with a considerable number of teeth, most of which he took the trouble to have previously sawn through; but I have not been able to make all the use of them I could have wished. Many go to show that there is truth in what I have inserted in this paper, and in what others have asserted before; but I hope next session to be able to give some statistics formed from the examination of a large number of teeth, both dry and fresh, which may prove interesting and serviceable. I may say that, out of four hundred and fifty or more teeth, one hundred and twelve or more have partially or wholly ossified, and probably many more; but, being dry teeth, many specimens of nodules of secondary dentine may have been spoilt in splitting or sawing through. Many nodules have dropped out since they were cut, I know. Several show

that the pulp had been destroyed by ulceration and gangrene, before there was a chance of secondary dentine forming. I have brought down the teeth with pulp calcification; but careful classification is necessary before they can become of practical value.

The PRESIDENT.—The paper just read by Mr. Cartwright has afforded us great satisfaction. It has touched upon the point which, of all others, has shown itself (by the former discussions of this Society) to be the subject which requires investigation. I think there are many gentlemen here who can furnish us with comments upon this matter. If so, we shall be very glad to hear them.

Mr. HARRISON.—Mr. President, I feel that it is due to Mr. Cartwright, after the very elaborate and excellent paper with which he has favoured us, not to allow more time than is unavoidable to elapse without making some comments upon it; and I may add, sir, that I know too well the discomfort of presiding over a meeting disposed to remain silent, to allow you on this, the first occasion on which you have occupied that chair, to remain long in that uncomfortable position. Under these circumstances, I rise to open the discussion on Mr. Cartwright's paper, although I have spoken so much upon the subject to which it refers on the last two or three occasions on which it has been brought before us, that I am very unwilling to be the first to rise this evening. So far as I have been able to collect Mr. Cartwright's views, after listening very attentively to his paper, I think that they agree very much with my own, as regards the treatment of the pulp, either when approaching exposure from, or actually exposed by disease. I quite agree with him that, in cases where the pulp is not actually exposed, but is covered by softened dentine, it is desirable only to clear out so much of the decay as we can short of exposing the pulp; carefully to clean its edges, and then to put in some stopping which does not require much pressure—(considering this as a temporary stopping only, used to arrest the decay, and give nature a chance, either of retaining the pulp in its normal condition, or of producing calcification)—with the intention of stopping the tooth in a more permanent manner at some future time. As bearing upon this point, and showing the efficacy of this mode of treating such cases, I beg to bring to the recollection of the Society a case which I mentioned I had treated in

this way, at our meeting in November last, and which (it not being a very favorable case even for such treatment) I then stated I feared I should see back again in a few days, with unfavorable results. I am happy to be able now to say, however, that my anticipations in regard to that case have not been fulfilled. The stopping was put in quite three months ago, and I heard of my patient the other day, when I had the satisfaction to learn that the tooth had remained quiet, and I presume, therefore, that the case is progressing favorably. The point, however, sir, upon which I had expected to hear Mr. Cartwright dwell more particularly, and on which I had hoped he would have given us his own views at greater length, was, how we are to treat cases in which the pulp has been actually exposed by decay—for that, after all, is the point upon which there exists the greatest difference of opinion, and about which we are all of us most interested. So far as I could gather Mr. Cartwright's views from his paper, I think he inclines, where the pulp is actually exposed by decay, to the destruction of it. I am not sure that I am right in this conclusion, and I pause for Mr. Cartwright's answer.

Mr. CARTWRIGHT.—Till lately, certainly.

Mr. HARRISON.—In that view, sir, I confess that, as a general rule, I agree. I think, for reasons which I have before stated, that when the pulp is actually exposed, there is so little chance of a successful result from *any* treatment that may be resorted to for its preservation, that generally the wiser plan is to destroy it. If we do not destroy it, I then think that, in stopping it, whatever plan we use—whether we cap the pulp, or stop without capping—our proper course is to drill into the pulp-cavity at the time of stopping; for I hold, that the stopping a tooth (whether with capping or not), when it is in a state of suppuration, with the idea that calcification will follow, is almost certain to entail upon our patients immense suffering, and to entail upon ourselves great discredit, unless we at the same time adopt some plan for giving exit to the secretion that is sure to accumulate under our stopping. In conclusion, I will say, sir, that I think one good result cannot fail to arise out of the manner in which this subject has been brought before us lately, and that is, that we shall have the plan of drilling into the pulp-cavity very much more extensively adopted in the cases alluded to, than it has heretofore been; and I am

persuaded that many teeth, and much suffering, will be saved to our patients, if that practice is more extensively, and at the same time judiciously used. I fear I have said nothing new upon this subject, sir, because, as I remarked when I rose, I have stated my views upon it fully on former occasions; but I thought it due to Mr. Cartwright to rise, and make a few remarks, rather than allow the meeting to sit in silence. I will now sit down, in the hope that other gentlemen, who have not yet spoken upon it, will favour us with their opinions. (Applause.)

Mr. T. A. ROGERS.—There can be no question, sir, as to the great difficulty of deciding what should in every case be done, either when the pulp is presented to us actually exposed, or is laid bare during an operation. When this is the case, it is, I think, much more easy to decide whether the tooth should be removed or retained, than whether the pulp should be preserved or destroyed; since there are certain cases in which there can be no doubt as to the impropriety of attempting operations of any kind in connection with the pulp. For example, where the constitution is naturally a bad one, where the vital powers have been depressed by illness, or where the nervous system is unusually irritable and sensitive. But after putting these cases aside, and narrowing the question to those where constitution, circumstance, and temperament are in our favour, there still remains the difficulty. The patient is healthy, willing to submit to any operation, the tooth well-developed, the decay not of a soft, cheesy nature, but brown and hardish;—what, then, is the proper mode of treatment to be pursued under these circumstances?

Unless there has been previous pain, or the exposed portion of the pulp is very extensive, or unless the cavity of decay is very shallow, and unlikely to hold a plug well, I should certainly try to save the nerve. If, however, irritation has been set up by the use of various preparations, or if there has been the slightest suppurative action, I conceive that no efforts will succeed in preserving the organ.

As regards the method of preserving the pulp, from my experience of late in gutta percha I should employ that substance as a temporary filling, trusting that calcification would go on underneath it, and allow the insertion, at a future period, of a gold plug.

With respect to Dr. Hullihen's operation,

it seems difficult to say whether this does save the vitality of the tooth or not. Some teeth, thus treated, become dead after the lapse of a few years, while others remain perfectly healthy to all appearance. There can, however, be no question as to the fact of the immediate greatly diminished sensibility of the pulp to external impressions, in the majority of cases, after drilling into the canal in the root of a tooth.

Next, when the destruction of the nerve is resolved upon, is it better to destroy it at once by means of instruments, either cold or heated, or, more gradually, by the application of caustic agents? In all cases where time permitted, I should choose the latter method, and should employ arsenic for the purpose; as, leaving out of the question the pain of the first plan, the arsenic, by causing shrivelling of the pulp, enables it to be more readily extracted—an operation not always easy of performance in the case of a freshly exposed living nerve. Care should, of course, be taken not to carry the caustic action too far; nor do I think it absolutely necessary to destroy the pulp to the very end of the fangs. It has always seemed to me preferable not to fill the roots directly after removing the nerve; on the contrary, I prefer to allow a few days to elapse, in order that any portion of animal matter remaining may escape, and meanwhile I insert a temporary filling of gutta percha, or of wool soaked in a saturated solution of mastic.

For some time past I have given up destroying the nerve in upper molar teeth, as I have seen cases, both in my own practice and in that of other dentists, where affections of the antrum have arisen therefrom, and I do not think I am justified in running the least risk of such a result.

MR. IBBETSON.—I did not clearly understand, and should be glad to be informed, whether Mr. Harrison, in what he said, meant that in all cases of filling over an exposed pulp, he would at the same time drill into the pulp-cavity.

MR. HARRISON.—Not in all cases. It depends upon the nature of the circumstances under which the pulp has been exposed. If, for instance, in excavating a tooth, I accidentally lay bare the pulp, I should proceed to stop that tooth at once, with a tolerable certainty, or at any rate with a very confident hope, that the case would succeed, and should not for a moment think of drilling into the pulp-cavity in such a case. But if a patient comes to me with an exposed pulp, and a tooth giving pain, and

on proceeding to clear out that tooth I find there is a secretion coming from the pulp-cavity, I think that, to stop such a tooth, without making an exit for the secretion which will necessarily form under the stopping, would be bad practice—inasmuch as, to do so, will almost certainly cause the patient to come back again in a short time, having suffered a great deal of pain, and will bring our practice into discredit. These are the cases in which I think we should either proceed to destroy the pulp at once, and subsequently stop the tooth—or, if we wish to give the pulp a chance of calcifying, or from some of those circumstances enumerated by Mr. Cartwright, *cannot* proceed to destroy it, should drill into the pulp-cavity at the time we stop, so as to give exit to any secretion that may be formed—as drilling into the pulp-cavity does not necessarily imply the destruction of the pulp, although it gives vent to any secretion which may form, and so prevents secondary mischief. That is what I meant to say when I last spoke, and I am sorry that I did not make myself fully understood.

Before I sit down, sir, I beg to draw the attention of the Society to an observation which fell from Mr. Rogers a little while ago. He said that he had given up altogether the practice of stopping upper molar teeth, where the pulp had been exposed, for fear of setting up disease of the antrum, and, as a rule, preferred extracting such teeth. Mr. Cartwright, on the contrary, stated that he had been, on the whole, more successful in stopping upper than lower molar teeth, under such circumstances. Here is a curious difference in the experience of these two gentlemen on this point!—a difference which would lead me to be glad to hear the experience of other members of the Society on the subject. So far as my own experience upon it goes, I confess that it confirms Mr. Cartwright's statement. I have seen no disadvantage following the stopping of the upper molar teeth under such circumstances; on the contrary, I should stop them with, if anything, greater confidence in the result being satisfactory, than I should the lower.

THE PRESIDENT.—In all cases of success or non-success, much will depend upon the constitution of the patient. I think you would never attempt the operation with a patient whom you believed to be of strumous habit.

MR. ROGERS.—No, I should not then. I should have very much disinclination to attempt a case where I believed the

constitution of the patient to be at all strumous.

Mr. SERCOMBE.—Mr. President, I have been very much impressed during the discussion this evening, and the discussions which have taken place on former evenings on this particular subject, by the great difference of opinion which has been expressed by gentlemen who are alike competent to form an opinion as to the treatment of exposed pulp. It occurs to me that it would be a very desirable thing that at this Hospital, where so large a field is afforded, and where we have such able men representing the profession, this subject should be carefully attended to, and the results carefully recorded. Men in large practice have not the time, when their patients leave them, to write out any observations that occur to them; and if they are industrious enough at the close of the day to do so, their observations are likely to be more or less incorrect—the facts not being then fresh on their mind. Those who have not a large practice see but few of such cases, and the results drawn from a few cases are not of much value. I would suggest to those gentlemen who discharge the duties of dental surgeons at the Dental Hospital the desirableness of directing their attention to this subject, and getting their dressers carefully to record the results of their treatment in all cases, so as to give us some statistics to guide us in this matter. We should be then in a position to form an opinion as to the best method of treating the exposed pulp. I agree most thoroughly with Mr. Rogers in his remarks on the treatment of exposed pulp of the upper molar teeth. I have seen cases in which the antrum has been involved, and much mischief has followed. The effects upon the root of a tooth which sometimes follow when the pulp has ossified, appear not to have been noticed to night, or very incidentally by Mr. Cartwright. He spoke of a small increase of cementum, and stated that it was not enough to account for the severe pain of which the patient complained. I must be allowed to object to that conclusion. I consider it might have been quite sufficient to produce in a highly nervous temperament the effect described. I have myself seen some of the most serious cases of constitutional irritation kept up apparently by very small exostoses on the teeth, so small, indeed, that I should have been inclined to have said that the effect was very much beyond the apparent cause; but inasmuch

as the effects have disappeared on the removal of these teeth, I am bound to believe that these small additions to the normal amount of cementum were the cause of them. We scarcely know how small a thing will produce irritation. It appears to me that where a pulp has been destroyed with arsenic, or any like irritant, the periosteum of the tooth is peculiarly prone to this condition afterwards. If such results follow, it becomes a question whether we are justified in all cases in endeavouring to save the teeth. It appears to me important to endeavour, by watching a large number of cases, to ascertain whether such results can be predicated in any class of cases. I just throw out this as a suggestion. I think it is a very important thing to endeavour to get together as large a number of cases as possible, and have them carefully recorded; and thus, in the course of time, we shall have a very valuable table of statistics on this point, and I think the most beneficial results would follow.

Mr. COLEMAN.—I have lately met with so much success in the adoption of a plan described at a recent meeting of the Society, that I intend, before long, to bring before the members some statistics showing the proportion of cases which have been saved in that way. With regard to destroying the pulp by arsenic, does this agent really act as an escharotic? perhaps it is a little foreign to this subject, but it is rather an interesting question. It is generally described by writers on materia medica as an irritant, and not as an escharotic. Perhaps gentlemen who have observed the effect of this, and escharotics, may be able to describe any peculiar differences that they have noticed in the action of these substances.

Mr. T. A. ROGERS.—I conceive that a substance which, when applied to animal matter, removes one of its elements, and so breaks up the tissue, should be classed as an escharotic; and arsenic, when applied to the pulp of a tooth, enters into combination with its albumen.

Mr. TOMES.—Mr. President, Mr. Rogers has alluded to disease of the antrum as one of the consequences of destruction of the pulp of the first permanent molar in the upper jaw, by arsenic or other escharotics. I have performed that operation not unfrequently, and it is certainly one I should not shrink from on the ground that disease of the antrum would be the probable result. I never saw a case of antrum disease as the effect of that treatment. I

cannot tell how many times I have performed the operation of destroying the pulp in the upper molars, but certainly in a very considerable number of cases. Perhaps more than a dozen or twenty times in the course of a year. It is an operation that I have been in the habit of performing for the last ten or twelve years, and in no instance has a patient returned with diseased antrum resulting from that treatment. I think I should have seen some of my patients, or heard of the cases, had any disease followed.

Mr. DREW.—I shall be happy to present to the Society a preparation which, in my opinion, clearly shows the impolicy of stopping the anterior upper molars with the mineral cement. I will just mention the circumstances. This patient (a gentleman from Kent) had suffered much pain in the malar bone, and there was a foetid condition of the secretion from the nose. The anterior molar had been filled in the ordinary way with amalgam, about two years before. I removed the tooth, made an opening into the antrum by means of the trocar, and hoped that it would end there; but the mischief was more extensive, and it became to him a serious case. Throbbing pains in the cheek continued, and he came again at the end of ten months, requesting me to remove the posterior molar, and I proceeded to do so; but, on using very gentle force, it, together with the dens sapientia and the adjacent part, broke down. My patient was a man of strumous diathesis, nervous, and extremely excitable temperament. I released the tooth from the forceps, and, on examination, found extensive hæmorrhage from the lacerated external palatine. The hæmorrhage was checked by pressure, and the teeth, &c., then removed. The mucous membrane was carefully placed over the space; three pledgets of lint, moistened with water and covered with sulphate of iron, were wrapped round pieces of cork, and pressed upon the vessels; one was removed on the second, and the others on the third day, and the parts healed; but I attribute almost all that occurred to the anterior molar having been stopped. For these reasons, I concur in Mr. Rogers' mode of treating that tooth. Mr. Fletcher saw the case I have been speaking of, and will probably recollect it when I bring the models to you. The patient is now obliged to wear an extremely deep piece, to make up for the deficiencies in the bones of the face.

There is one mode of preparing this tooth for stopping which I can recommend. It is, by placing a small inverted capping of tortoiseshell, or horn, or bone, on the pulp, first putting a couple of crystals of the chloride of calcium upon it. That softens the horn, &c., and enables one to fill the tooth. I have stopped several in this way, where I dared not use the amalgam.

Mr. TOMES.—I think Mr. Drew will allow me to inquire whether the pulp of the tooth to which he attributes the disease of the jaw had been fully destroyed and removed prior to the introduction of the filling. In cases where the treatment adopted has been attended with prejudicial results, it is of great importance that the steps of the operation should be exactly described, in order that a correct opinion may be formed as to the cause of failure.

Mr. DREW.—I was given to understand so. It was not done by me; but my patient said all sensibility in the tooth was gone.

Mr. CARTWRIGHT.—I can tell the Society of a case where a preparation of arsenic and creosote was put into a cavity in an upper molar tooth, and not covered over, the consequence of which was, that it oozed out, and the patient (a gentleman) lost two teeth and a proportionate amount of jaw-bone. That was not the fault of the use of arsenic, but the fault was in the neglect of the practitioner to adopt precautionary measures; and that did not militate at all against the justice of destroying the pulp and filling up a cavity in an upper molar tooth. I have done it in numerous cases, and never saw any affection of the antrum arise from it. It is an operation performed every day by practitioners. It does not follow that you may succeed in every tooth; but where we see one case in which any affection of the antrum is produced, we may hear of, or see, a thousand or more in which it is not produced. We cannot argue from isolated cases; but I think there is a reason why teeth in the upper jaw should bear treatment better than in the lower jaw. If inflammation, after filling a tooth in the lower jaw, take place, a fistulous opening is not so likely to be established, owing to the thickness of the outer and inner plates, but a bulging out of the bone, which does not occur in the upper jaw. You find fistulous openings established either in the outer or inner plate, which are much thinner than in the lower jaw, and that

affords relief, and prevents the chance of antrum disease. Mr. Drew's is an isolated case; it is a rare case, and one that might not happen once, or at all events but very seldom, in a man's lifetime; therefore, it affords no argument to invalidate the practice of filling up the upper molar teeth after destruction of the pulp; and, if we are to take out every molar instead of filling it, I pity the unfortunate individuals' mouths—and this I say with all due deference to Mr. Rogers.

Mr. DREW.—I was speaking principally with reference to the anterior upper molar.

Mr. WALKER.—Mr. President, a case bearing out Mr. Thomas Rogers' experience, relative to the treatment of upper molar teeth with caustics, came under my notice last winter, when attending hospital practice.

A young woman applied for admission, with swelling in the face and neck on the right side. She had considerable pain, and was quite unable to close the mouth. On inquiry, she stated that some few months previously, on experiencing pain in a tooth, she applied to a dentist, who treated the tooth with strong applications for a few days, and then plugged it; subsequently, pain came on, which compelled her to lose the tooth; still great stiffness of jaw remained, and eventually swelling came on.

On admission into the hospital, the first upper molar of the right side was wanting, the second molar tooth was nearly invisible, the dens sapientia quite so, from the swelling of the soft parts. The last-named tooth could be reached only by passing a probe up to the extent of an inch, or an inch and a-half. She could not bring the mouth close by half an inch at central incisors. For several weeks the swelling continued to increase, and pus exuded from the sockets of all the teeth of the right side of upper or superior maxillary bone. In about six weeks small openings became visible on the external surface of the face; on passing a probe through one of them necrosed bone was detected.

An operation was undertaken, about the ninth week after admission, and a piece of the superior maxilla, an inch in length, was taken away; several spicula of bone came away afterwards, and the second molar tooth, being very loose, was extracted.

As it is only necessary to show what serious results may follow the application of strong escharotics to the upper molar teeth, it is needless to continue the history of this case any further; but I will merely

state that the swelling of face, stiffness and immobility of lower jaw, remained for several months, and several spiculae of bone came away. When the patient left the hospital she could again masticate her food.

The patient was neither of a strumous diathesis, nor had she any signs of syphilitic taint; her brothers and sisters were reported to be all well, and in robust health.

The PRESIDENT.—Gentlemen, our time has now expired, and I think we have all listened to this paper with the greatest attention and interest. It is not an ordinary production. We have not had such a communication presented to the Society for a very considerable period. (Applause.) It is a paper that would do credit to any man. We want the results of practice and experience—here we have them. I am sure I can congratulate the Society on having had such a subject brought before them; and I have great pleasure in returning the thanks of the Society to Mr. Cartwright for his very valuable paper. (Applause.) The Society will now adjourn.

THE DENTAL HOSPITAL OF LONDON,

No. 32, SOHO SQUARE.

THE ANNUAL GENERAL MEETING of Governors of this Hospital was held on Thursday, January 31st, in the board-room of the institution.

Mr. THOMAS BELL, F.R.S., having been called to the chair, expressed the great gratification he felt at being requested to preside at a meeting of an Institution which he considered as calculated to confer very great benefits on the community, and, as connected with an important and well-conducted School, to raise the standard of professional character amongst the whole body of practitioners of Dental Surgery. After some farther observations he called upon the Honorary Secretary to read the following reports:—

Report of the Committee of Management, presented to the General Meeting, January 31, 1861.

In accordance with the laws, the Committee of Management now begs to lay before the Governors a statement of the

general affairs of the Hospital; and it has the gratification to be able again to report to you that the progress made during the past year has been in every way satisfactory.

The report of the Medical Committee, which will be presented to you, shows how entirely the views of the founders of the Charity have been confirmed. The rapidly increasing number of those who seek for attendance and advice, and the variety of operations, hitherto beyond the reach of the poorer classes from the expense necessarily entailed by them, which have been performed, prove that one of the main objects for which the Hospital was instituted has been already attained.

And the second, and no less important, object, the thorough education of students in the principles and practice of Dental Surgery, is being as effectually carried out. The Hospital is the only one specially devoted to Dental Surgery which has been recognised by the Royal College of Surgeons; and the number of the students who are seeking their education within its walls shows that the great advantages which are here offered have been already appreciated.

So greatly has the number of patients who come to the Hospital for advice and treatment increased, that, in accordance with the recommendations contained in a report of your medical officers, the Committee of Management has authorised the appointment of "pupil assistants," who shall, under the direction of the Dental Surgeons, take such part in the practical treatment of the patients as may be assigned to them. The "pupil assistants" will be selected only from amongst the more advanced students, in whose competence to perform their allotted duties the surgeons shall have entire confidence. By this arrangement, while much unnecessary labour will be saved to the dental surgeons, and much time to the patients, the opportunities of acquiring practical knowledge and skill by the students in the Hospital will be largely increased, and will undoubtedly prove most valuable to them.

Your Committee has also sanctioned another recommendation contained in the same report—viz., that an additional room shall be fitted up on the ground-floor, wherein patients may be attended. The necessity for these arrangements was quite obvious to your Committee, and shows

the greatly increased work which is now being carried on.

The School, in connexion with the Hospital, is now fitted up with all the appliances necessary for the education of the students; and the Odontological Society has kindly placed its museum at the disposal of the lecturers for the purposes of instruction. In addition to the collections of preparations belonging to this Society, a museum is in process of formation by the School, and two members of the staff (Mr. Tomes and Mr. Cartwright) have deposited their extensive private collections in the museum, for the use of the lecturers. These collections form together the largest and most valuable series of dental preparations in Europe.

By the Report of the Auditors for the past year, you will see that there is a balance in favour of the Hospital of £37 5s. 5d. only, against £84 4s. 10d. on the previous year, while the expenses of the past year have been considerably less than those of the previous year. This diminution of the balance shows that increased endeavours are called for on the part of the friends and supporters of the Hospital to obtain subscriptions and contributions. This is the more important, inasmuch as a large proportion of the receipts of the Hospital is derived from the letting of part of the premises to the Medical Council and the Odontological Society, and can only, therefore, be depended on from year to year.

The lessee of the freeholders of the premises, under whom the trustees of the Hospital held, being desirous of surrendering his lease, an offer was made to your Committee by the freeholders to grant to the Hospital a new lease on the same conditions as are contained in the existing one, the expenses to be borne by the Hospital. Your Committee desired for many reasons to accept this offer; but one of your trustees (Mr. Robinson) declined to take part in any new arrangement. This difficulty has, your Committee is happy to report, been removed, by Mr. Robinson agreeing to surrender his trust. Your Committee thought it desirable that a new trustee should be named, and Mr. Harrison, to whom the Hospital has already been much indebted for the active share he has taken in its affairs, being willing to accept the trust, your Committee has elected him to the office, and it has reason to believe that the necessary

arrangements consequent upon this change will soon be brought to a satisfactory conclusion.

Your Committee cannot allow this opportunity to pass without expressing its warmest thanks to the remaining trustees, Mr. Arnold Rogers and Mr. Saunders, for most liberally coming forward with the offer to bear themselves the entire cost attendant on the grant of the new lease; thus relieving your Committee of a doubt which it had felt as to the propriety of incurring this additional expense.

According to the laws of the Hospital, one third of your Committee must in the present year go out by ballot, but the retiring members are eligible for re-election. Mr. Harrison becomes an ex-officio member of the Committee, on his becoming a trustee, and Mr. Ibbetson ceased to be a member on his being elected a medical officer. The members retiring by ballot for the present year are—Dr. Babington, Mr. Bigg, Mr. Chilvar, Mr. Dyer, Mr. Fletcher, Mr. Harker, Mr. James Parkinson, Mr. Sercombe, and Mr. Tomes; and the Committee recommend the election of Mr. Hepburn, Mr. F. Rogers, Mr. Sibley, Mr. Walkinshaw, Mr. J. Gregory Forbes, and Mr. H. Rogers; and the re-election of Mr. Bigg, Mr. Fletcher, Mr. James Parkinson, Mr. Sercombe, and Mr. Tomes on the Committee for the ensuing year.

In conclusion, your Committee cannot but hope that the Governors will agree with it, in considering the present state of the Hospital to be highly satisfactory. Renewed endeavours will certainly be required to maintain it in its present efficient state; but your Committee feels satisfied that a Hospital which is effecting so much good, whether as a charitable institution or as a school for the training of well-educated and skilful dental surgeons, will obtain, the more its claims become known, the support of the public, and will continue to receive the aid and countenance of those through whose exertions it has been founded.

CAMPBELL DE MORGAN,
Chairman.

*Report of the Medical Committee,
January 1st, 1861.*

In presenting their report for the year 1860 to the general meeting of the governors of the Dental Hospital of London, the Medical Committee congratulate them on

the great and successful progress the charity has made during the year.

The conviction expressed in their report of January 1st, 1859, that when the existence of the Hospital comes to be more generally known and its objects understood, the peculiar benefits it is intended to afford to the poor will be both fully appreciated and largely sought for, "has been realised beyond their most sanguine expectations."

4612 patients have been attended during the year 1860, being more than double the number of those who availed themselves of the charity in 1859.

The case-books show that the operations performed have been as follows:

Extractions.

Children under fourteen years	1376
Adults	1593
	2969
Gold fillings	261
Foil fillings	368
Other fillings	363
Irregularities of teeth treated surgically and mechanically	293
Miscellaneous cases, advice, &c.	1329

The medical officers refer with pleasure to the fact that the Hospital has received the highest testimonial to its efficiency in its official recognition by the College of Surgeons on the 23d May, 1860, and that it is, up to the present time, the only special Dental Hospital the attendance upon whose practice has been thus recognised.

The number of pupils attending the London School of Dental Surgery has largely increased, and the progress of these gentlemen has been so satisfactory that, in accordance with a suggestion contained in the last report, the Committee of Management have agreed to appoint two of them to assist the medical officers, under the title of "pupil assistants," the largely increasing number of patients rendering it imperative that some help should be afforded to the Dental Surgeons.

In conclusion, the medical officers tender their thanks to the governors for the assistance they have afforded them by their increased care in the distribution of tickets for special operations, and thus preventing an abuse of the charity.

G. A. IBBETSON.
JOHN TOMES.
ROBERT HEPBURN.
S. CARTWRIGHT, jun.
CHARLES ROGERS.
THOMAS UNDERWOOD.

TREASURER'S REPORT.

1860.	Dr.	£	s.	d.
Jan. To Balance at the Bankers .		84	4	10
„ Life Governors' Subscriptions .		70	7	0
„ Annual Subscriptions . . .		99	15	0
„ Donations		45	16	0
„ Money found in Box, voluntary Subscriptions . . .		3	11	7
„ Dr. Hawkins, for Rent of Offices to Michaelmas last .		130	0	0
„ Odontological Society, for Rent to Christmas last .		60	0	0

£493 14 5

1860.	Cr.	£	s.	d.
By Rent to Midsummer, 1860 .		135	15	0
„ House Repairs, &c.:				
Blackmore		2	7	4
Ditto		11	15	0
Cubitt and Co.		2	0	3
Carpenter		0	4	6
Waterman		9	2	0
Merling		0	4	9
Kreutz		0	5	6
		25	19	4
„ Rates and Taxes to Christmas:				
Water		4	12	0
Poor		15	0	0
General		9	7	6
Sewer		3	15	0
Gas		15	7	6
House		7	10	0
Land		10	18	8
		66	10	8
„ Insurance for seven years, from 25th March, 1860, to the 25th March, 1867 .		7	4	0
„ Law Expenses		2	9	2
„ Postage, Stationery, and Printing		5	10	0
„ House Expenses:				
Petty Cash		6	18	9
Blackwell		1	5	6
		8	4	3
„ Salary to Assistant Secretary .		68	5	0
„ Wages for Porter, Messenger, and Housekeeper .		80	0	6
„ Collector's Commission . . .		6	14	0
„ Surgical Appliances		11	8	9
„ Balance at the Bankers . . .		77	13	9
		£493	14	5

Examined and found correct, Jan. 24th, 1861.

W. H. BUCKLEE, }
HENRY ROGERS, } *Auditors.*

Mr. HARRISON.—I have very great pleasure, sir, in rising to propose the reception and adoption of the reports that have just been read. The contents of these reports must, I think, have been very gratifying to the governors of this Institution who are present, and could not be otherwise than gratifying to those who are absent, if made known to them—the one as showing the care and judgment with which the affairs of this Hospital have been managed (although efforts, I regret to say, have been made in certain quarters to give rise to a contrary opinion in the minds of the public)—and the other as showing how much good is being done by it to the poor, of a nature which no other Institution in the metropolis affords. I beg, then, to move—

That the reports of the Committee of Management and of the Medical Com-

mittee be received and adopted; and, together with the balance-sheet, circulated in the usual way.

Mr. WALKINSHAW having seconded the motion,

The CHAIRMAN said, that he had listened to the reports which had been read with the greatest pleasure. Whether in reference to the immediate benefits conferred upon the poor, or the instruction of pupils, the accounts were highly satisfactory; and he doubted not that, if the Institution were more generally known, it would be supported to an extent more commensurate with its great advantages.

The motion was then put, and carried unanimously.

Mr. UNDERWOOD, in proposing Mr. George Harker as a Vice-president, said, that Mr. Harker took a very deep interest in the success of the Charity, and he therefore

had great pleasure in proposing that his name be added to the list of Vice-presidents.

Mr. DE MORGAN seconded the resolution, which was carried unanimously.

The election of the Committee of Management for the ensuing year was then proceeded with in the usual way, by ballot; and the Chairman announced that the following gentlemen were elected, in the place of some of those who had gone out, by ballot, viz.:—Messrs. Hepburn, F. Rogers, Sibley, Walkinshaw, J. Gregory Forbes, and H. Rogers; and the following gentlemen, who had also gone out, re-elected, viz.:—Messrs. Bigg, Fletcher, Jas. Parkinson, Sercombe, and Tomes.

On the motion of Mr. TOMES, seconded by Mr. UNDERWOOD, Mr. Bucklee and Mr. Thomas Rogers were elected Auditors for the current year.

Mr. IBBETSON, referring to certain reports that had been circulated to the prejudice of the Hospital, moved—

That the Committee of Management be requested to inform the meeting what foundation there was for those reports.

The motion having been seconded by Mr. JAMES PARKINSON, and carried,

Mr. DE MORGAN, as Chairman of the Committee, called upon the Hon. Secretary to read the correspondence in his possession, relating to the subject.

The HON. SECRETARY.—Before reading the correspondence which has taken place on this subject, I may say, by way of introduction, that it having come to the knowledge of the Committee that several subscribers to the Hospital declined renewing their contributions, on account of being informed by Mr. Robinson that he had not the same confidence in its management as formerly, and that, in one instance, Mr. Robinson had kept back a life subscription forwarded to him for the Hospital by a lady who was his patient, the Committee deemed it necessary to inquire into these circumstances. The result was, that I was directed by the Committee to write to Mr. Robinson, and inquire if these statements were true. I wrote to Mr. Robinson accordingly, and received in reply the following letter:

5, Gower Street, Bedford Square;
October 18th, 1860.

MY DEAR SIR,—Thanks for your kind note; and the various donations you mention are quite correct. And as regards

Mrs. Y—'s donation, it now stands thus: She first became an annual subscriber, and her subscription, with others, I forwarded. Subsequently, I heard from Miss Y— that Mrs. Y— would prefer being a life-governor, and that Miss Y—'s name was to be substituted as an annual subscriber. This I mentioned at the time. Whether the alteration has ever been made in any late list of subscribers I cannot say, as I have never been able to procure one. Somewhere about November, I believe, Mrs. Y— sent me ten pounds. I wrote, and acknowledged its receipt, and stated that I had not the same confidence in the management of the Hospital as when I first solicited her patronage, and that I would return the money if she would acquaint me with her wishes. In reply, I received a letter from Mrs. Y—, stating I was to retain it for the present, since which I have heard nothing more; but as I shall have an opportunity of seeing Miss Y— in the course of a few days, I will then ascertain her wishes upon the matter, and will act accordingly. I shall be happy to show you my private list, some evening, if it will assist you with others in making out your list.

I remain,

My dear Sir,

Yours sincerely,

J. ROBINSON.

A. HILL, Esq.

I was then directed by the Committee to write to Mr. Robinson, and request him to state the grounds on which he had lost confidence in the management of the Hospital, when I received the following letter and enclosure:

5, Gower Street, Bedford Square;
Dec. 17th, 1860.

MY DEAR SIR,—I beg to acknowledge the receipt of your letter containing the resolution of the Committee which has reference to myself, and in reply I forward you a copy of a letter received by me.

I remain,

My dear Sir,

Yours sincerely,

J. ROBINSON.

A. HILL, Esq.

P.S.—I shall reserve to myself the option of publishing this correspondence, &c., if I think proper.

J. R.

(Copy.)

Howard Lodge, Maida Vale;
29th July, 1859.

MY DEAR SIR,—You will remember that, at your solicitation, I some time ago promised to become an annual subscriber to the Dental Hospital, and, further, would have made a donation towards its establishment, had I not seen reason to alter my intention.

I received a note from the Secretary, enclosing me some cards for the use of patients, and referring me to some rules as to their exercise. But I not only had no rules sent me, but my name was misspelt, my address was altogether wrong, and the whole thing was a blundering production.

I wrote to the Secretary, and pointed out the matters, and mentioned I would call in Soho Square, and pay my subscription, the first time I happened to be that way.

Some weeks subsequently, I called in Soho Square, and could only see a tall, gaunt porter, who treated me with a degree of incivility I have never experienced before. To my repeated statements to him that I had simply called to pay my subscription to the Dental Hospital, I got only curt answers—"You can't pay it."—"Call again."—"You are too late," &c. When I said, "Surely you will be good enough to take my money?" he said, "No, I won't."

I am too old and too wise to lose my temper, but I most certainly will keep my money out of the hands of an institution conducted like the Dental Hospital of London.

I am,

My dear Sir,

Yours most sincerely,

C. STEPHENS.

To J. Robinson, Esq.

These letters having been laid before the Committee, I was instructed to write again to Mr. Robinson, and inquire whether he had any other grounds of complaint against the management of the Hospital. I addressed to him a letter, of which the following is a copy:

38, Euston Square;

Dec. 19th, 1860.

MY DEAR SIR,—I laid your letter and enclosure before the Committee at the meeting on Monday evening last, and I am directed to inquire whether the complaint therein made constitutes your sole charge

against the Board of Management. If you have any further complaint to prefer, the Committee would esteem it a favour if you would, through me, make them acquainted with it, without further delay.

Believe me,

My dear Sir,

Yours faithfully,

ALFRED HILL.

J. ROBINSON, Esq.

To which Mr. Robinson replied, on the following day, thus:

5, Gower St., Bedford Square;

Dec. 20th, 1860.

MY DEAR SIR,—In acknowledging the receipt of your note of the 19th, I beg to say in reply, that I consider the resolution of the Committee has been met by the copy of W. Stephens' letter, enclosed in my last.

I remain,

My dear Sir,

Yours very truly,

J. ROBINSON.

A. HILL, Esq.

P.S.—In the last list of subscribers, &c., published, you will find No. 7, instead of 5, Gower Street, Bedford Square, after my name. Will you be good enough to have this rectified when you print a new list.

Shortly after the receipt of this letter a communication was made to the Committee by Mr. Arnold Rogers and Mr. Saunders, to the effect that Mr. Robinson had offered to resign his office of Trustee, when the Committee deemed it expedient not to pursue this matter further, until the necessary arrangements consequent on Mr. Robinson's resignation were completed; and thus it stands at present.

I do not feel myself called upon, sir, to make any general remarks on this correspondence, but I cannot sit down without saying, in reference to the charge of incivility brought against our Hospital porter, that, having had very frequent opportunities of judging of his conduct, I consider it my duty to avow that such an act as Mr. Stephens has charged him with would be in direct opposition to his general demeanour. This is the only occasion, since he has been in the Institution, that any charge against him has reached the Committee, who, I believe, are fully satisfied with his attention and behaviour.

Mr. DE MORGAN said there was one

point which had not been noticed by the Honorary Secretary, which he thought should not pass without comment. As had been already stated, it had come to the knowledge of the Committee that, through the representations of Mr. Robinson, many persons had been induced to withdraw their subscriptions from the Hospital, and when Mr. Robinson was asked what reason he had for declaring that he had withdrawn his confidence from the Committee of Management, and for asking governors to withhold their subscriptions, he forwarded, as the ground for his opinion, the letter from Mr. Stephens, which had been read, and which contained the trivial charge that a name and address had been wrongly inserted in the list of governors, and the improbable one that Mr. Stephens had been insulted by the porter, when he came to pay some money. But the point to which he (Mr. De Morgan) wished to draw attention was this—that Mr. Robinson, a trustee, and supposed supporter of the Hospital, had had this letter in his possession for more than a year—had, as he alleges, in consequence of it, been using his influence to the prejudice of the Hospital—and yet, during the whole time, had never had the ordinary courtesy and candour, until called upon, to tell the Committee that such a letter had been received by him, and to ask for an explanation. Had he done so he would have learnt that the error in the address of Mr. Stephens, which was one of the important facts on which the charge was grounded, was one of his (Mr. Robinson's) *own making*, and that the address was copied exactly from his own list, which is now in the possession of the Secretary. It was a question whether such conduct was worth taking further notice of by the Committee; but it was very important that the truth should be known to the governors, as injury had already been done by Mr. Robinson's representations, and it was natural that it should be so when it was known that they came from a trustee of the charity. The course taken by Mr. Robinson he felt needed no further comment from him after the letters that had been read.

Mr. HARRISON.—As one of the early promoters and as a warm friend of this Hospital, which I consider to have been most unfairly dealt with by Mr. Robinson, I beg, sir, to be allowed to make a few observations on the correspondence which has just been read. I think, sir, that we have a right to infer, from Mr. Robinson's letter of December the 20th, that he *has*

no other grounds for withdrawing his confidence from the management of this Hospital, and for acting towards it as he has done, than those contained in Mr. Stephens's letter; and I would ask the present meeting whether the statements contained in that letter (supposing them to be strictly correct) form sufficient grounds for a man, holding the office which Mr. Robinson did in this Institution, and professing to be its friend, to arrive at such a decision from? Was the substituting a 'v' for 'ph' in spelling the name of Stephens, or the insertion of a wrong address, on the first occasion on which a name appears in a printed list, any ground whatever for withdrawing confidence from the management of an Institution, whose Secretary has accidentally made these mistakes? Or did the alleged conduct of our porter, even, constitute any sufficient reason for a professed friend of such an Institution acting in the manner in which Mr. Robinson admits himself to have done? Was it not rather his duty to have endeavoured to calm down the irritated feelings of his friend, Mr. Stephens, and to have brought the matter under the notice of the Committee of Management (of which, be it observed, he was one), that it might be thoroughly examined into and explained? I feel confident that there is not a gentleman in this room who will not agree with me that such was his proper course. But, sir, there is a point in this matter that perhaps has not presented itself to the minds of many present, to which I particularly wish to draw the attention of this meeting. If we look at the date of Mr. Stephens's letter, it will be found to be July 29th, 1859. Now, this Hospital was opened in December, 1858, and Mr. Stephens received the cards to which he alludes in the commencement of his letter in the beginning of 1859, in consequence of his name having been sent to our Secretary, among others, by Mr. Robinson, with one guinea, as his first annual subscription. How, then, I would ask, did a second subscription fall due before the July following, and what subscription could Mr. Stephens have called to pay before that month? Here is a fact which involves his statement in a mystery, and requires explanation,—as, *prima facie*, it would almost seem to throw a doubt upon the genuineness of this whole proceeding. I do not wish to say anything disrespectful of Mr. Stephens, but I think we are entitled to an explanation on this point. And now, sir, a few words as to the alleged

incivility of our porter. All of us, who know him, know him to be a most unlikely man to be uncivil to any one with whom he is brought in contact in the discharge of his duties, and certainly not likely to be uncivil to a gentleman calling for such an object as that which Mr. Stephens is said to have called about. That he might have declined to receive this subscription, if offered, I can readily believe—and, if so, I think he showed more judgment in declining to receive it than Mr. Stephens did in offering it to him—and that Mr. Stephens may have imagined himself curtly answered, and insulted, I can also believe—for, although he says he is too old and too wise to lose his temper, it is pretty clear, I think, from his own letter, that he must have lost his temper about the matter—or why should he have withheld a donation from a charitable institution which he thought worthy of support, simply because its porter was (or was supposed to have been) uncivil to him? Would it not have been his more dignified course—was it not the probable course of a man, *unswayed by temper*, if he really meant to serve the Institution—to have represented the matter to its higher authorities, and to have withheld his intended donation, or not, afterwards, according to the explanation given, or, if necessary, apology made? That a man of Mr. Stephens's apparent temperament may have imagined himself curtly answered and insulted, I can, sir (as I have just said), readily understand; but that our porter offered him any *intentional* insult, or treated him in the curt and uncivil manner described, I must take leave to say, from my thorough knowledge of his character, that I cannot for a moment bring myself to believe. Looking at this matter, then, sir, in all its bearings, I feel myself entitled to ask this meeting if the charge of mismanagement brought against its late Committee does not fall entirely to the ground? Nay, more—looking at it as calmly and dispassionately as I can—I feel myself justified in saying that it rests upon circumstances, and has been accompanied with conduct, which is anything but creditable to the gentlemen who have brought it forward—particularly to Mr. Robinson, as a trustee, and, at the time these circumstances are said to have occurred, a professed friend of this Institution. I am very sorry, sir, to have been obliged to speak of two gentlemen in this manner; but there are occasions on which a man's private feelings should give way to the discharge

of his public duties, and, conceiving this to be an occasion of the kind, I have felt myself called upon to do so.

Mr. IBBETSON.—I beg, sir, as a governor of this Institution, to say that I am perfectly satisfied with the explanation that has been given us by the Committee of Management, and I have very great pleasure in moving the following resolution—

That the best thanks of the Governors be given to the late Committee of Management, for their services during the past year.

Mr. WALKINSHAW having seconded the motion,

The CHAIRMAN, in putting the resolution to the meeting, said that, under ordinary circumstances, he should have done so without remark, but the statement which had just been made appeared to him to be a very melancholy one, and had excited in his mind a feeling of deep sorrow. He forbore to make any comments upon the correspondence which had been read, further than to say that, in his opinion, there did not rest the shadow of an imputation upon the Committee of Management.

The motion was then put, and carried with marked demonstrations of approbation.

Mr. UNDERWOOD said, that Mr. Parkinson had, from the commencement of the existence of the Hospital, been most untiring in his exertions to advance its interests, and much of their success was owing to this. He felt quite sure the Governors would agree with him in offering their best thanks to their excellent and respected Treasurer. He therefore begged to move—

That the thanks of the Governors be given to the Treasurer, for his valuable services during the past year.

This motion was seconded by Mr. HARRISON, and carried unanimously.

Mr. PARKINSON, in returning thanks for the kindness expressed, said that very little thanks were due to him, as he had so little comparatively to do. He wished he had more to do in the way of giving receipts for annual subscriptions, &c.

Mr. HILLS, in rising to propose—

That the thanks of the meeting be given to the Medical Officers, for the very assiduous manner in which they have fulfilled their arduous duties during the past year, said that it afforded him much pleasure to move the resolution. Having been

on the Committee of Management from the formation of the Institution, he had watched its proceedings with great interest, and felt assured that the Institution only required to be better known to obtain greater support. He suggested that all those who were on the Committee of Management should induce their friends and other benevolent persons to come to the Hospital and see their proceedings, feeling convinced that, when they saw the working of the Institution and the great benefit which the patients derived under the skilful treatment of the most eminent in the profession, they would be induced to become subscribers, and thus enable the Committee to carry out, to the fullest extent, the objects of the Institution, by assisting the poor, and by establishing a school for education, from which all, both rich and poor, would derive benefit. He laid great stress on the very assiduous manner in which the Medical Officers had fulfilled their arduous duties, and hoped that the Committee and their friends would support the Medical Officers, and thus promote the interests of the Institution.

Mr. ALFRED CANTON having seconded the motion,

The CHAIRMAN, in putting it to the meeting, said if the names of the Medical Officers were more generally known to the public, he was sure the charity would be greatly benefited.

The motion being put, was carried unanimously.

Mr. DE MORGAN begged to propose a vote of thanks to Messrs. Rogers and Saunders for the very liberal manner in which they had come forward to offer to defray the expenses of the new lease. The Committee had had no doubt as to the advantage of obtaining a lease under the freeholders, but they had been in doubt as to the propriety of their incurring new expense. From this the two trustees, Mr. Arnold Rogers and Mr. Saunders, had relieved them, by taking on themselves the cost. Mr. De Morgan thought too that, though he was not at that time a trustee, the thanks of the Governors were due to Mr. Harrison, now appointed a trustee in the room of Mr. Robinson, for the great trouble he had taken, and the zeal he had shown in behalf of the Hospital.

The motion having been seconded by Mr. UNDERWOOD, was carried unanimously.

Mr. SAUNDERS expressed his acknowledg-

ments. In volunteering, in conjunction with Mr. Rogers, to bear the expense of a new lease, they were anxious, not merely to place the Institution in an independent and advantageous position without burdening its funds, but at the same time to express in a most unequivocal manner their undiminished confidence in its management.

Mr. MUMMERY, in proposing a vote of thanks to Mr. Alfred Hill, the Honorary Secretary, said he felt assured that the meeting would cordially join with him in expressing their satisfaction at the able and zealous manner in which the Honorary Secretary had discharged the duties of his office, not only during the past year, but from the first formation of the Hospital. He felt that, for his untiring zeal and great exertions in promoting its interests, the friends and supporters of the Hospital owed to Mr. Hill a deep debt of gratitude, and he had great pleasure in publicly expressing this opinion. He would take this opportunity of stating his conviction that the invaluable and extensive benefits conferred on the suffering poor by this excellent Institution were but little known to the general public—the very existence of a special Hospital for diseases of the teeth being not generally known. He would urge upon the meeting the importance of a strenuous effort to diffuse information on the subject, and thus to increase the number of subscribers.

The motion having been seconded by Mr. J. H. PARKINSON, was carried unanimously.

Mr. HILL said,—Sir, when this Institution was projected, I willingly took my place by the side of other gentlemen engaged in forming it, feeling certain that, with sincerity of motive and energy of action as our rule, it must succeed. From the very first I had the highest confidence in its present supporters, and was thoroughly convinced that, both as a professional requirement and a public want, such an establishment was loudly called for. England has many charities, and London is especially rich in benevolent institutions of kindred natures to this Hospital, but I am certain that none are more needed, or more highly appreciated, than the Dental Hospital of London, as the report which I have had the pleasure of reading most abundantly proves. It is with feelings of much gratification—and, I confess, a little pride also—that I have heard the very kind remarks of Mr. Mummery, and the flattering manner with which those remarks have

been received by the meeting; and I can only add, that the humble measure of usefulness I have been able to contribute towards the general good has been rendered much more as a pleasure than a duty. I beg to thank the Governors for their acknowledgment of my efforts, and to assure them that I shall ever be most anxious to promote by every possible exertion the welfare of our Hospital.

Mr. SAUNDERS then said,—Before this meeting separates, gentlemen, I must be guilty of the apparent discourtesy of addressing myself to you, for a few minutes, rather than to our Chairman. I have the privilege to propose for your acceptance the following resolution:

That the cordial thanks of the meeting be given to the Chairman, Thos. Bell, Esq., for his kindness in taking the chair, and for the able manner in which he has discharged its duties.

Gentlemen,—I feel that Mr. Bell's name has been too long and too intimately associated with all scientific and philanthropic objects to make it necessary for me to occupy any length of time in recommending this resolution to you. I will only say that I congratulate this Institution on having so potential a name among its Vice-Presidents—that I congratulate this meeting on having him to preside over its proceedings—and I will make bold to add, that I congratulate Mr. Bell himself on having been called upon to preside over this meeting—surrounded as he is by a band of men who, disdaining all selfish and petty aims, are devoting, in the most self-sacrificing spirit, their energies, their time, and their skill, to the advancement of their profession, and to the sacred cause of humanity, through this valuable Institution.

This having been seconded by Mr. HILLS, was carried with acclamation.

Mr. BELL said,—During the forty-five years that I have been in practice, it has been my most earnest aspiration that the branch of the profession to which I attached myself should be raised to an equality with any other department of the

medical profession. The establishment of the Odontological Society, the institution of a Hospital for the treatment of diseases of the teeth, and the recognition of the Surgeon-dentists by the Royal College of Surgeons, in constituting a Board of Examiners, and granting a diploma in Dental Surgery, must tend to produce this result, and have already, I may say, realised some of my warmest hopes. I consider it a great privilege to have had the opportunity of meeting so many of my respected colleagues upon such an occasion as this, and an honour to have been called on to preside at this meeting. I sincerely thank you for the cordial manner in which you have received the resolution so kindly proposed by my friend Mr. Saunders.

APPOINTMENT OF DENTIST TO THE ROYAL SOUTH HANTS INFIRMARY.

AN adjourned meeting of the Governors of the Infirmary took place on Tuesday, the 5th instant, to discuss and decide upon the question of appointing a surgeon-dentist to this Institution, and what the qualification of that officer should be. The subject was thoroughly ventilated, and ended in the adoption of the following rule, which was carried with only two dissentients:

"No one shall be eligible as dentist unless he possesses the dental diploma of some legally constituted body."

The original proposition had been, that a "surgeon-dentist should be appointed," but it was agreed that the prefix "surgeon" should be removed, as the dental diploma of the Royal College of Surgeons alone would give a legal right to such title. It was further decided "that no appointment should be made until the expiration of six months," thus giving any dentist an opportunity of possessing himself, in the mean time, of the dental licence of the Royal College of Surgeons.

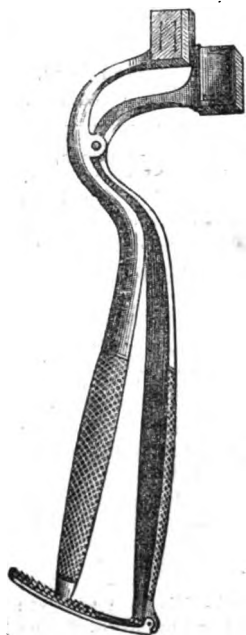
The Month: Miscellanea and Scientific Intelligence.

AN INSTRUMENT FOR KEEPING THE MOUTH OPEN IN OPERATIONS UNDER CHLOROFORM.

By ALFRED COLEMAN, M.B.C.S., &c.
Dental Surgeon to the Metropolitan Free Hospital.

(From the 'Medical Times and Gazette,'
Jan. 26th, 1861.)

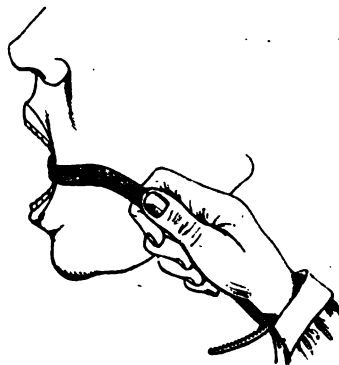
THIS instrument is constructed upon the principle of a pair of forceps, with this difference, however, that the handles do not cross each other at the hinge, so that, by pressing them together, the blades or short extremities are separated. About the hinge the instrument is curved upon



itself. Attached to one of the handles is a spring-catch, which keeps the blades fixed at any required distance from each other. The extremities of the blades are made broad, and covered on their outer surface with vulcanised india-rubber. In using the instrument the handles are opened and the blades brought together, and the latter are introduced between the

teeth at the back of the mouth, at the opposite side to that on which any operation is to be performed. The curve of the instrument adapts itself to the cheek, and prevents either the handles or blades being in the operator's way. By compressing the handles the blades, and, consequently, the patient's jaws, are separated from each other, and, by means of the catch, can be maintained in the required position at the will of the operator.

The instrument was constructed and is best adapted for operations on the teeth under chloroform, but it has been found useful in other operations on the mouth as well. It possesses the following advantages:—Of being readily introduced into,



and removed from, the mouth—of quickly increasing or diminishing the distance of the jaws from each other—of enabling the assistant who administers the chloroform to apply this agent from time to time without removing the instrument from the mouth—of being quite out of the way of the operator—and, by means of the vulcanised india-rubber pads, of avoiding all risk of injury to the teeth or gums.

The instrument is constructed by Messrs. Ferguson and Sons, of Giltspur-street.

This instrument has, we learn, been employed on several occasions by Mr. Lawrence, in operations on the mouth, also by Mr. Paget and by other surgeons.—Ed. 'B. J. D. S.'

CHLOROFORM.

(From the 'Medical Times and Gazette,'
Jan. 19th, 1861.)

To the Editor of the 'Medical Times and
Gazette.'

SIR,—I very much fear that the case in your journal of the 12th inst. must be taken to be a death really from chloroform. I explained at Oxford that, in reality, hospital practice shows that very small doses of chloroform, paradoxical as it may seem, are decidedly the most dangerous, and that death begins—not in the heart, but in something like a gentle spasm, or tetanic tension of the respiratory muscles; there is no mistake at all about this fact with amylene. The point, however, I now wish to refer to is the following:—I saw two cases in Paris, operated on exceedingly like that referred to in your journal of the 12th inst. The patients in each case were horribly frightened; each had a smashed ankle, and it was necessary to adopt a primary operation. They both dreaded the operation very much, just as the man already referred to; each was just the style of case where one would refrain from chloroform. Complete *empuiselement*, which seems to signify with the French more than our word "shock,"—in fact, a state made up of tendency to syncope, with great intolerance of pain, collapse, and sickness; and to these we may add *quoad* chloroform, intense emotional alarm. The following manœuvre saved these patients—it may be worth keeping in mind. Emotional alarm is an intangible entity that some might disregard; but it probably was the real cause of the death in the case in your journal of the 12th. Emotional alarm causes a tendency to syncope; if you have this decidedly pronounced syncope already, it is dangerous to give the chloroform; if you remove the emotional alarm you remove the tendency to syncope. This latter, of course, is a mental operation, and in place of bringing the patient with his crushed ankle into the operating theatre, instruments rattled and prepared, stoves lighted, students summoned, &c., the following was the plan adopted:—The patient's consent was quietly obtained to have the leg off; and, "to-morrow at twelve o'clock," was rather ostentatiously named as the time it would be done. The surgeons pretended to go away, but suddenly said, "By the way you may as well have a little

chloroform when we go away, it will get you sleep." The assistant was cautioned in a sort of heterodox Latin to be cautious of the anæsthetic, with syncope threatening, &c. The patient then, who previously resisted the chloroform, took it well. Our knowing friend, M. Roux, came back in about ten minutes, and took off the leg in the ward on the instant.

I am, &c.,

CHARLES KIDD, M.D.

Sackville Street; Jan. 14th.

ROYAL COLLEGE OF SURGEONS.

DIPLOMA OF DENTAL SURGERY

THE following gentlemen, having passed their examination, received the Diploma of Dental Surgery on Tuesday, February 19th, 1861:—Messrs. W. Fort, 94, Fishergate, Preston; T. M. Cardell, 80, Lemon Street, Truro; S. A. Parker, 18½, Colman Row, Birmingham; F. Bullin, 13, White Friars, Chester; F. W. Mitchell, 8, Percy Place, Clapham Road; G. Lyddon, 5, Grove Terrace, Southsea; C. H. Bromley, 1, Portland Terrace, Southampton; J. H. C. E. King, Cambridge House, Portsmouth; W. E. Jameson, 78, Grosvenor Street.

BOOKS RECEIVED.

'The Dental Cosmos,' January, 1861.

'The Dental Register,' January, 1861.

'Der Zahnartz,' Nov. and Dec., 1860.

'Revue Odontotichnique,' Nov. and Dec., 1860.

To Correspondents.

NOTICE.

Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.

Owing to the great length of the reports of the Odontological Society and Dental Hospital Annual Meeting, we have been obliged to defer several papers of interest.

"W. L. Merry."—We have sent you a pamphlet which will give you the information you require.

"Mr. Cobbs."—Will you favour us with your address? The envelope you sent has been mislaid.

"Mr. Spence Bate, Plymouth."—Thanks for your suggestion; we will act upon it.

"J. Walker, Wimpole Street."—Thanks; but the papers do not reach us till 9 p.m.

Communications have been received from Messrs. W. L. Merry, G. Ibbetson, A. Coleman, Campbell de Morgan, George Owen, Thos. H. Harding, — Cobbs, Spence Bate, and J. Walker.

British Journal of Dental Science.

No. 57.

LONDON, MARCH, 1861.

VOL. IV.

Dental Surgery and Medicine.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

(From 'The Dental Cosmos,' October, 1860.)

(Continued from page 2.)

Another source of dental diseases is, I incline to believe, occasionally due to a relaxation of the tonsil glands. These glands, as we know, are situated between the arches of the fauces, and their eliminations are under the control of the will, that is, I mean we can swallow or eject them at pleasure. The glands are lobulated, and in a relaxed condition afford lodgment in the interstices of the lobes for particles of food. The decomposition of the animal and vegetable matter is always considered in a diagnosis of foul breath, as we will remember. The acid reaction of this constantly decomposing material, when such condition exists, must surely act on the teeth, coming as it does in contact with them, the irritation induced in the fauces causing the patient first to hawk the fluid into the mouth that he may spit it away. The acid formed would, I suppose, be sulphurous or sulphuric, according as a full saturation of the base might or might not take place; or, if the lodged particles partook more of a strictly nitrogenous diet than of the usual mixed food of the omnivora, nitric acid might as easily be the result; the production of sulphuric acid would cause greater irritation of the fauces, because of its affinity for water.

The tonsil glands are very easily seen by depressing the tongue, and such a condition as just mentioned would be very easily discoverable. Perhaps the best local treatment would be found in touching the parts occasionally with a weak solution

of chloride of zinc, or in the use of gargles of a stimulating character. Any constitutional treatment required would be, of course, influenced by the disease or condition.

I will refer very briefly to caries as influenced by the strumous cachexia. That caries is a common attendant upon this condition is made evident by the examination of any case; the teeth of such patients are found of that dull, lifeless white, making our art valueless, as we need not attempt to save them by operation, unless the cachexia is first removed. As remarked by Dr. Wood, in his 'Practice,' "a knowledge of the causes which favour the development of the disease may aid us in somewhat understanding this." These causes are almost all of a character fitted to lessen the energies of the system, and impoverish the blood. Of course the ill effects produced on the teeth are secondary, the result of deteriorated blood and secretions; you find the caries to partake of the humid character, and to give off in its progress an offensive odour, showing the preponderance of animal matter in the teeth. When scrofula attacks the adult, you will find the teeth, if pearly, losing their translucency and becoming opaque. Here is a direct evidence of a blood disease, or blood impoverishment, and with such an opponent it is not simply preposterous to suppose that, as the dental specialty is concerned, it performs its part when a pellet or two of gold is inserted in the tooth or teeth affected? I will not say we must treat the patient constitutionally, but I will say the case can only be treated successfully in such a manner. It will be answered that teeth in which the animal matter preponderates should be the most

capable of resisting decay. This would be true, if it were not for the blood deterioration alluded to; the scale of vitality is lowered, and the very deterioration affecting this loss of resistance gives power or destructive force to the attacking agent, thus demonstrating the view I have so often advanced, that caries is both of the tooth and out of it.

The scorbutic habit or cachexia has an important bearing on dental or rather medico-dental practice. I do not allude to that extreme condition of the disease described as occurring among sailors on long voyages, but to the modified condition, as seen in almost every day practice. The disease, as I would describe it, is one in which the blood is depraved, a tendency to subacute inflammation, local congestion, passive effusions, exhibiting its existence markedly in the gums, which are passively congested, presenting a dull, relaxed appearance, bleeding very freely on the slightest touch, the secretory ability of its mucous crypts completely destroyed, the teeth loosened and undergoing destruction by the semi-sordes matter present about their necks. Caries, the result of this class of scurvy, is much more frequently met with by the country than the city practitioner. When practising in New Jersey, some years since, I had an opportunity to gain much experience in it. I think its cause may be found in a too common use of salt meat; at any rate, I have always found this the principal animal food used by persons afflicted with the disease, and have been enabled to arrest the caries by a complete change in the manner of living. The local treatment is the same as suggested as having been found so successful in mercurial sore mouth: the free use of the laneet, the careful employment of iodine; and perhaps the potassæ chloras is not ill replaced with some of the dilute acid preparations. I say the careful use of iodine, for, applied in a too concentrated form, you may destroy the little remaining vitality of the part, giving yourself a trouble not anticipated. Diseases presenting such marked local characteristics as this last, convince

the practitioner of the necessity of treatment apart from the local; indeed, he cannot operate upon the teeth until he has made an improvement on the subjacent parts; or, if he should attempt it, he would soon have the *cast-off* teeth for his pains.

The green discolourations found often about the necks of the teeth, observable particularly on the incisors, is another of the constitutional causes of caries. I believe it is universally acknowledged as being indicative of a general atonic irritability of the mucous membrane, and is very often attended with sour breath and eructations. We all know how impossible it is to keep this deposit removed through scaling. The best agent I have found is the internal exhibition of the mineral acids. Most of them will answer; but, in my experience, the speediest effect will be obtained with the nitro-muriatic—say five drops administered in a little sweetened milk or water three times a day. The local ill effects of this powerful acid may be neutralized with a single drop of ammonia, diluted, or strong Labarraque's solution.

Salivary calculus of almost every class possesses a constitutional origin, that is, there is either an indolent condition of the glands, or some peculiar character of the blood, from which the material is eliminated. Dr. Harris gives us an instructive and interesting chapter on these deposits, but unfortunately fails to suggest anything as to the general medication required.

The pale, yellowish-brown tartar, mentioned in the work alluded to, is, I think, but a modification of the green, as the same general treatment will retard or entirely stop the deposit.

Salivary calculus, then, may be known to be a disease when there is no indolence on the part of the secretory organ, and a local origin may be taken into the diagnosis when the inference seems reasonable that the production is not eliminated with sufficient rapidity because of some adynamic condition of the gland or glands.

(To be continued.)

Mechanical Dentistry.

To the Editor of the 'British Journal of Dental Science.'

SIR,—A friend of mine (not a member of the dental profession) having contrived and obtained for me a small gas-stove for the work-bench, I beg to send the following description of it, which, although imperfect, is the best I can furnish.

It consists of a cylinder of galvanized sheet-iron (ordinary sheet-iron would do), seven inches in height and three and a quarter in diameter, open at the bottom and closed at the top with fine copper gauze, secured there by means of a flange and binding wire. This is supported on a base similar to that of a common retort-stand, and raised sufficiently high as to allow plenty of atmospheric air to mingle with the gas supplied by two gas-pipes, fixed so as to rise the one to the top, and the other a few inches within the cylinder. The former is three quarters of an inch in diameter, open at the top, and pierced with four holes about two inches from the bottom. The latter is one quarter of an inch in diameter, closed at top, about half an inch from which it is also pierced with four holes the size of a small broach. The former produces a small flame proportioned to its diameter, and the latter by allowing the gas to collect, produces a flame the width of the cylinder, whilst

the admixture of air obtained by perforating the larger and by the position of the smaller pipe and of the cylinder, renders combustion more perfect than could otherwise be obtained, being somewhat like the heat produced by an argand spirit-lamp, with a chimney as described in Fownes' 'Manual of Chemistry,' p. 178. Two taps to regulate the gas, a retort-stand attached to the cylinder by a binding screw, and india-rubber tubing to connect the stove with any burner that may be deemed suitable, complete the apparatus.

Its utility (to the dentist) is chiefly found when wishing to solder a set of flat teeth. It is well known how difficult it is to heat the teeth and under part of the plate impartially and without disturbing the solder. This difficulty is lessened if not removed by using the stove above described. Having protected the plate and teeth with plaster as usual, and placed the piece on the stand, the flame may be so regulated and made to surround the piece as to prepare it for soldering much more rapidly and equally than by the blowpipe or by a common fire. It is also useful for boiling water or for heating oil.

Some of your readers may have something similar in use, but others may not, and for such this is written.

Yours truly,
SPES.

Chemical Department.

PRACTICAL HINTS ON ELECTRICITY IN RELATION TO ELECTRO-PHYSIOLOGICAL APPARATUS. By J. N. HEARDER, Electrician, Plymouth.

(Continued from page 8.)

ELECTRO-MAGNETIC EFFECTS OF CONDUCTION.

BESIDES the thermal effects developed in wires when the electric force is transmitted through them, there are other correlative actions which are exhibited by the passage of the current, which seem to be

external to the conducting wire, and to surround it like an atmosphere. These are termed the electro-magnetic effects, and are best developed when the conductor offers the least amount of resistance to the current.

If a wire forming the connexion between the poles of a voltaic battery be stretched or coiled under a sheet of paper, and some iron filings be then sprinkled upon the paper, they will be attracted by the wire, and will arrange themselves on the paper symmetrically with the position of the wire below, and, if minutely examined, will be

seen arranged in a series of short lines, whose direction is transverse to the axis of the wire.

If, whilst a copper wire is transmitting an electrical current, a piece of iron wire be laid across it at right angles to its axis, one end of the iron wire will be found to possess north, and the other south, magnetic polarity.

Let, now, one end of the iron wire be depressed, so as to make it gradually assume first an oblique and then a vertical direction, still keeping it in contact with the copper wire, and at right angles to its axis. The end which is north will still remain north.

Continue to pass the iron wire still in the same direction, that is, gradually bringing the lower end round the copper wire from the vertical to the horizontal direction, so that the wire at last stands horizontally across the conducting wire, but below it instead of above it. The north and south ends still remain the same, but it will be seen that they have now changed positions with regard to their first direction, for supposing the north to have been on the right when the iron wire was on the top of the conducting wire, by depressing that end and gradually passing it round under the conducting wire, it at last comes up again to the horizontal position, but is now on the left side. If, now, the piece of iron be moved still in the same direction, bringing it gradually up round the opposite side of the conductor and round over the top to the position from which it first started, the north and south ends will be found to have retained their polarity unchanged. This shows that the magnetism developed about a copper wire is transversely to its axis and tangentially to its surface in one uniform direction in relation to the course of the current; thus, if two iron wires be laid parallel to each other on opposite sides of the conducting wire, the proximate ends of the two wires will be possessed of different polarities. This transverse development of

magnetism is most readily shown by placing a copper wire parallel to and over a magnetic needle suspended on a pivot and at rest in the magnetic meridian. The moment a voltaic current is passed through the wire, the magnetic needle is diverted to the right or left, according to the direction of the voltaic current; but in whatever direction it is deflected when the conducting wire is above the needle, that direction is reversed when the conductor is placed below the needle, the current remaining the same. This is the principle of the galvanometer, and the deflection of the needle towards the right-angle position is more or less, according to the strength of the voltaic current.

Take an iron bar, and lay across it a portion of a conducting wire through which a current is passing; the iron bar will appear slightly magnetic. Let the conducting wire be made to pass once round the bar, and the magnetism would be greatly increased. Pass the conducting wire now ten or a dozen times round the bar, examining the effect after each successive coil, and the magnetism will be seen to increase in proportion to the number of turns. The exact relation between the development of magnetism in iron and the exciting electricity, whether by the number of coils or increased electro-motive force, was determined by the author about twenty years since.

When the magnetic intensity is low, its development is in a higher ratio than the increments of exciting electric force. As the intensity increases, these ratios become equal; but as the iron approaches what may be termed a condition of magnetic saturation, the ratio of magnetic increase is far below that of the exciting electricity. This is a fact necessary to be borne in mind in the construction of electro-magnetic apparatus; otherwise there will be an undue expenditure of electrical force.

(To be continued.)

British Journal of Dental Science.

LONDON, MARCH, 1861.

"Say what you have to say boldly; never mind what people say in answer to it; never mind your misstatements being exposed, or your fallacies being unravelled. When your adversary has done, say it again yet more boldly than you did at first. This logic of reiteration, when practised vigorously,

habitually, and impudently, is almost as irresistible as the logic of facts in the mouth of an emperor commanding half a million of bayonets."

OUR sensitive friends in Cavendish Square acknowledge the truth of the fore-

going statement in the firmness and constancy with which they practise the precepts it embodies.

They tell us boldly, and reiterate the statement, that their purpose is to advance the interests and uphold the dignity of the dental profession. But they elect as members, and arm with their diploma, advertising dentists, and encourage them to take part in the College meetings. They pretend to the confidence of the dental profession, and ignore the fact that their proceedings have been condemned in a protest signed by upwards of 200 dentists of acknowledged position and unquestioned respectability. They boast of a counter-protest, but suppress the undeniable fact that their weakness obliged them to solicit the support of notorious advertisers, pupils, workmen, and, in one or more cases, even servants, in order to avoid numerical insignificance in their list. They boast of the signature of 3000 medical men in support of the College of Dentists; but they neglect to state that they applied to upwards of 13,000, and that 10,000 declined to have anything to do with them, or treated the application with silent contempt. They cite these signatures as though they had been fairly gained, and ignore the undoubted fact that they were solicited by means of a circular containing only *ex parte* statements, the first paragraph even of which will not stand the test of inquiry.

In the numerous reprints of this mediant circular, they state that the protest was signed by ninety-four dentists—a fact on a particular day (the first of its publication), but for one day only, the number rapidly increasing to 218 (the number in the second publication); but the College of Dentists ignore the latter fact, and sticking to their principles, publish ninety-four as the number,* while they state the number of their own adherents as upwards of 200—the highest point the counter-protest reached. They state in their circular “that the College of Surgeons having

passed a resolution for granting certificates of Dentistry;” but they suppress the fact that the College of Surgeons is empowered by a charter to grant, after examination, diplomas in Dental Surgery, and that the charter received the sanction of the Medical Council, in which body all the chartered medical institutions are represented, and that the assent of the Council is equivalent to the assent of the whole profession.

They accuse others of misrepresentation, and in the very same paragraph carry out the principles so tersely put at the head of this article. They tell us “a protest has been signed by those dentists who have been appointed examiners by the College of Surgeons, and by certain other dentists;” but they know the protest was drawn by a committee over which Mr. Harrison presided, and that it was signed by the leading dentists of the metropolis before the examiners were appointed, and before it could by any possibility be known who would be elected as examiners. Hence the imputation that the protest was the work of the examiners squares with the principles adopted by our friends.

The medical profession is told that the public will not distinguish between the qualification in Dental Surgery and the membership of the College of Surgeons—in other words, between the dental and general surgeon; and they ignore the established fact that a general surgeon, when he adopts the specialty of dentistry, is never confounded with, or practises as, a general surgeon. They express a strong interest in the weal of the general surgeon, and pay him the compliment of watching over his interests. They ask for his opinion and support, and endeavour to blind him by *ex parte* statements, made without reference to the truth, coupled with an insinuation that his position is endangered.* Now, as regards these medical signatures, we know that many were given in total ignorance of the bearing of the question at issue, and under the impression (conveyed by the circular) that the leading dentists

* ‘Trans. Col. Dentists,’ April to Dec., 1860.

* Loc. cit.

objected to the steps taken by the College of Surgeons. Consequently medical men gave their names in support of a cause which they were cajoled into supposing embodied the interest of dental practitioners.

In plain fact, the College of Dentists conceived that the medical profession might be treated as the public is dealt with by the advertising dentists, and the experiment appears to have succeeded in three cases out of thirteen.

But it will be with the College as with its advertising members; the trick may be played once, but it will not bear repetition. The game is exhausted and the manor cleared in a single shot. So much for the executive of the College; now let us see what the individual members have to say. A member of the council, in a letter published in a Hampshire paper, tells the Southampton people that the College dis-countenances dental advertising; that "if one case of disreputable advertising be brought under the notice of the council, I can promise the offender will be immediately removed from the list of members." We do not happen to know what value Mr. Rymer attaches to the term "disreputable;" but that the use of professional advertisements is regarded in the professional world as anything but reputable, does not admit of dispute.

That it is not a question of one, or two, or three advertisers, admits of demonstration. It is difficult to suppose that Mr. Rymer is unacquainted with the fact that a greater number than three have been elected by the College of Dentists even at the last two meetings; and that in reviewing the lists published in the 'Dental Review' since June last, the advertising members may be counted not by units but by tens. What has become of the black-book, the book of dental advertisements collected some time back at considerable cost and labour? And we would further ask, is not the College accepting names which were rejected when the institution was in more responsible hands? On the authority of Mr. Hockley, another

member of the executive, Mr. Passenger states that the College of Surgeons admit without examination, in violation of their rules. This statement occurred in a discussion on dental qualification, reported in the *Hampshire Advertiser*, February 9th, 1861, and proves to be at total variance with the truth.

Did our space allow, we might quote numerous similar instances of the want of agreement between statements and facts; but surely we have adduced sufficient evidence to justify the opinion we have put forward respecting the proceedings of the College of Dentists.

But, after all, the College of Dentists of England is a fine name, and it is a fine thing to be a member of its executive. To be called a secretary of the College of Dentists of England, a treasurer of the College of Dentists of England, or still more, a president of the College of Dentists of England, is rather grand than otherwise. So long as people can be found sufficiently childish to furnish funds by the purchase of toy diplomas, the workers of this grand company will try to smother the voice of those who rejoice not in shams. But all this might be done without throwing such sickening showers of unctuous cant, about elevating the status of the dental profession, over their transactions. Why not admit that the whole thing is a farce, in which dentists play the principal parts; that, for the time it lasts, the managers of the entertainment enjoy a conspicuous position? Their names go out in the handbills, and for aught the world knows, they may be great people; and although the paper structure must, like a tower of cards, break down, still that their turn may have been served, and their appetite for acting satiated, before the final catastrophe.

Men find amusement in strange practices, and pride themselves in strange fancies. That a dozen or two of men should call themselves a College, and, without the slightest vestige of authority, offer for sale professional diplomas, is a strange and lu-

dicrous proceeding; but infinitely more strange and ludicrous is the spectacle of men with sterling money in their hands accepting, in its stead, the worthless paper. The idea suggests itself, that these poor fellows are oppressed by an irresistible craving for a diploma, and, fearing that a legitimate qualification is not within their reach, grasp at what in general appearance bears some resemblance to the coveted document.

To attempt, in sober earnest, any refutation, or offer any excuse for the lamentable fact that the acts of the executive of the College of Dentists are calculated to place the advertising dentists on a level with those who pursue a more professional course, by the degradation of the latter, would be a mere act of madness; the fact has become notorious. But they might, perhaps, inform us why they prefer the country to the town advertiser. It cannot be pretended that the man who advertises in the weekly paper of a country town is superior, in a professional point of view, to one who uses the *Times* to spread his fame. Is it that the College authorities fancy that country advertisements, couched in peculiar English, are seen but by few, and that the authors may

be elected without the majority of the members recognising the character of their professional associates?

Surely the professional world never saw a more humiliating exhibition than that which is forced upon our notice by newspaper paragraphs, reports of meetings, letters, and the circular from the College of Dentists itself.

We commenced this article with a quotation which gave, in a few words, the practice of the College of Dentists; and we will conclude with an extract, which embodies the creed of the denizens of 5, Cavendish Square.

"Yes, argument is poor, weak stuff. It is all very well for lawyers, who are paid for it; and for scholars, who have nothing better to do; but for the practical mind there is nothing like good, bold, blustering assertion. Speak out bravely, and people will take for granted you mean what you say, and that you know all about it. Speak out yet more bravely, when your adversary has finished his argument. Don't degrade yourself to his level by answering his reasonings. Pass them by boldly, as 'beneath contempt,' and people will take for granted that you do not answer them simply because they are not worth answering."

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

CORRESPONDENCE BETWEEN MR. RYMER AND THE EDITOR OF THE 'BRITISH JOURNAL OF DENTAL SCIENCE.'

College of Dentists of England,
5, Cavendish Square, London, W.,
February 13th, 1861.

SIR,—The leading article of the 'British Journal of Dental Science,' for the past month, has been brought under the notice of the council of this College. As the general tenor of the article is of a nature calculated to throw discredit upon the College, by means of unfounded assertions with reference to the status of its mem-

bers I am instructed to request that you will answer the following questions, viz.:

1. Do you mean to imply that the College of Dentists consists, with two or three exceptions, of blacksmiths, barbers, &c.?

2. If so, who are the persons alluded to as being blacksmiths and the like?

3. Upon what authority do you state that the members of the college generally consist of a few *ci-devant* workmen, unworthy the name of professional men, and their pupils and assistants?

The council deem it their duty to demand that this letter be inserted in your

next impression, together with replies to the questions it contains.

I am, Sir,
Your obedient servant,
SAMUEL LEE RYMER,
Hon. Sec.

To the Editor of the
'British Journal of Dental Science.'

Monday, February 25th, 1861.

The editor of the 'British Journal of Dental Science' presents his compliments to Mr. Rymer, and has to acknowledge the receipt of his letter of the 18th instant, which he begs to state (as will be shown by the accompanying copies of a correspondence* between the publisher and himself respecting it) reached him only on the afternoon of Friday, 22d instant.

The editor refers Mr. Rymer to his leader of this month, published (in consequence of this accidental delay) *before* he had received Mr. Rymer's letter, as constituting an answer to the inquiries therein, and showing that those inquiries rest upon an entire misapprehension of the leader referred to.

The editor concludes that it will not now be the wish of the council of the College of Dentists that Mr. Rymer's letter, and his answer, should appear in his Journal; but, if such should be still the wish of the council of the College of Dentists, he can have no objection to their insertion.

To Samuel Lee Rymer, Esq.

*(Correspondence referred to.)

February 22d, 1861.

The editor of the 'British Journal of Dental Science' presents his compliments to Mr. Churchill, and begs to inform him that he has this day received from his office, a letter from Mr. Samuel Lee Rymer, addressed "To the editor of the 'British Journal of Dental Science,' 11, New Burlington Street," bearing date February 18th.

The editor would feel much obliged if Mr. Churchill would inform him how so great a delay has occurred between the receipt of the letter at the office and its transmission to the editor.

The post-mark on the envelope of Mr. Rymer's letter bears the date, February 14th.

11, New Burlington Street, London, W.,
25th February, 1861.

DEAR SIR,—I regret if at any time irregularity should occur in my publishing office.

I have made minute inquiries as to the delivery of the letter you refer to, and my young men cannot fix the particular date of its transmission to you. I fear, however, that some neglect has occurred in this instance, and I have given instructions as to the importance of early and exact attention to this duty. I trust no similar cause of neglect will occur.

I am,
Yours faithfully,
JOHN CHURCHILL.

To the Editor of the
'British Journal of Dental Science.'

North End, Croydon, S.,
27th February, 1861.

SIR,—I beg to acknowledge the receipt of your note of the 25th instant, which I will lay before the council of the College of Dentists.

I remain, Sir,
Yours faithfully,
SAMUEL LEE RYMER,
Hon. Sec. College of Dentists.

The Editor of the
'British Journal of Dental Science.'

College of Dentists of England.
5, Cavendish Square, London, W.,
March 7th, 1861.

SIR,—Your note of the 25th ultimo has been laid before the council, and I am instructed to inform you that they cannot regard the article to which you refer as an answer to my letter.

Under the circumstances, the council feel it their duty to request the insertion of the correspondence in the next number of your Journal.

I remain, Sir,
Your obedient servant,
SAMUEL LEE RYMER,
Hon. Sec.

To the Editor of the
'British Journal of Dental Science.'

11, New Burlington Street.

The editor of the 'British Journal of Dental Science' begs to acknowledge the receipt of Mr. Rymer's note of the 17th instant, and will have much pleasure in publishing the correspondence, as requested.

March 8th, 1861.

To Samuel Lee Rymer, Esq..

[We have published the foregoing correspondence, as our readers will perceive, at the request of the Council of the College of Dentists. What object these

gentlemen can have in wishing it to be published, after our letter of the 25th ultimo, we are at a loss to conceive; but must remark upon it, that if anything were wanting to confirm our observation of the "ludicrous emotions" evinced by

these gentlemen without cause, we think they have furnished it to us by this request. If, however, our opponents will not take a friendly hint, and cannot see when they are "running their heads into a furze-bush," they must take the consequences.—*Ed.*]

Literary Notices and Selections.

Essays and Observations on Natural History, Anatomy, Physiology, Psychology and Geology. By John Hunter. Edited by Richard Owen, D.C.L. 2 vols. (Van Voorst.)—*'Athenæum,'* March 9, 1861.

John Hunter is one of the few distinguished men of this country whose name is as familiar to the general public as to the members of the profession to which he belonged. Yet his reputation is somewhat different in the two classes. With the public, he is known as a student of God's works and the founder of a great museum; with the profession, he is regarded as the type of the scientific and successful surgeon. With either, the basis of his great reputation is ill understood. As the student has approached the life of John Hunter to examine the sources of his celebrity and of the influence he has exercised on the thought and progress of his age, he has been met by difficulties, not only in the obscurity of some of his writings, but in the mysterious want of evidence to show that he understood the great lessons taught by his vast museum. As volume after volume of the catalogue was produced by the great anatomist who had been appointed the curator of his museum, increasing evidence was given that Hunter knew more than the world had yet given him credit for. As this evidence became more decisive, the memory of the man who, as friend and relative, had first purloined and misunderstood, and then destroyed, the writings which John Hunter had left behind him, became more execrated.

With the loss of these papers, all readers of the biographers of John Hunter have been more or less acquainted. It will, however, be a surprise and a delight to thousands to know that the present volumes contain the bulk of those missing

manuscripts. They appear like a true Phoenix from their ashes, and though they may not increase the general reputation of John Hunter, they will, at least, form the justification of those who have seen in his museum the proofs of a higher and wider philosophy, and a larger knowledge of the laws of life than any of his hitherto published writings afford. They are too late to become the teacher and the guide of the student of biological science in the present day; but they afford bright glimpses of the genius that directed and impelled the labours of Hunter, and are a precious contribution to the history of the workings of a great mind in its endeavours to unravel the intricacies of animal organization.

But what are the circumstances of this resurrection? How has the spirit been recovered from the material flames that set Sir Everard Home's chimney on fire in the month of July, 1823? In order to answer these questions, it will, perhaps, be best to refresh our memories with some of the facts of John Hunter's history, the correct dates for which are given in the Appendix to the present volumes.

John Hunter was born on the 14th of February, 1728, at Long Calderwood, Kilbride, near Glasgow. He was the brother of the celebrated William Hunter, who was the early friend and companion of the still more celebrated William Cullen. Every one has heard the story of these two Willies, who agreed alternately to work at home and make money, where-with to enable the other to go and study at the University. In 1741, William Hunter, having graduated at Glasgow, came to London, and there commenced lecturing on anatomy. In the mean time John was apprenticed to a cabinet-maker. He appears to have worked diligently at his business, and great has been the regret of all his biographers that his time was

thus uselessly employed. In 1748, he came to London to assist his brother, and we are told that he immediately distinguished himself for the assiduity with which he studied anatomy, and the skill with which he conducted his dissections. From this the inference would appear to be, that the habits of observation, and the manual dexterity acquired during his employment as a cabinet-maker, rather assisted than retarded the development of the great anatomist and museum founder. Hunter may not have read in after life so much as many men—but in an active life like his, in which the work of many lives was crowded into one, it is fair to infer that had he read more, he would have worked less, perhaps have thought less. At any rate, he was quite up to the conventionalities of his profession when he entered himself as a "gentleman commoner" at St. Mary's, Oxford, in 1753. Whatever might have been his design in this proceeding, he soon abandoned all university courses of education, and in 1756 obtained the appointment of house-surgeon at St. George's Hospital. In subsequent years he lectured with his brother at the School of Anatomy, in Great Windmill Street, and in 1761 accompanied the expedition to Belleisle, as surgeon in the army. He returned to London in 1763, resumed his anatomical studies, read papers at the Royal Society, and in 1767 was elected a Fellow of that body. In 1769, he was made surgeon to St. George's Hospital. In 1770, Dr. Jenner, the celebrated discoverer of vaccination, became his house pupil. In 1771, he married Miss Home; and, in 1772, Mr. Home (afterwards Sir Everard), his evil genius, was his pupil. This explains the relationship by which Sir Everard became eventually his trustee, executor, successor, and betrayer. In 1774, he gave his first course of lectures "On the Principles of Surgery." These he afterwards published. In 1776, he was appointed surgeon extraordinary to the King. In 1783, he purchased the lease of the house, No. 29, Leicester Square, and the ground extending to and including a house in Castle Street, and began to build his museum on the intervening space. The museum was finished in 1787—the preparations all arranged and visitors admitted. In 1792 Mr. William Clift was articled as an apprentice to John Hunter, who died suddenly at St. George's Hospital in 1793.

The last two facts are important in the elucidation of the history of these two volumes. Young Clift had not been with Hunter more than twenty months before he died. On this occurrence, Clift was left in sole charge of the specimens and papers of Hunter till they were sold to the public in accordance with Hunter's will. This document, which was made, according to Mr. Clift, only six months before his death, expresses that "all his collections of natural history, and the cases and other things belonging thereto, or used therewith, be offered for sale in one entire lot to the Government of Great Britain, at such prices as may be considered as reasonable to both parties." No bargain was made between John Hunter's executors, Dr. Baillie and Sir Everard Home, till the year 1800, when the collection was bought by the nation for £15,000, and presented to the Royal College of Surgeons. The college, however, seemed somewhat embarrassed with its precious gift, and left its arrangement and superintendence chiefly to Sir Everard Home. Up to the year 1814, Home distinguished himself by the delivering of several courses of lectures on Comparative Anatomy, which were published in six volumes quarto. From this time up to 1823, no inquiries seem to have been made for any manuscripts that had been left by John Hunter, in order to label and arrange the objects in his museum. In fact, it appears that had it not been for the affectionate reverence which young Clift had acquired for the labours and memory of his great master, this grand museum would have become a wreck. All honour to the man who, with powers and abilities that might have won for him reputation and fortune in his profession, chose rather to devote his days to the humbler, but, in his eyes, infinitely nobler task, of preserving this great history of natural facts from destruction. In 1825, he was somewhat relieved of his anxieties when the eccentric genius of Abernethy insisted on the appointment of the present superintendent of the Natural History Collection in the British Museum, as curator of the Hunterian Museum. Mr. Owen entered on his labours, but without the written descriptions of Hunter to guide him in the arrangement of his collection. Home had, in fact, burned all Hunter's manuscripts. "In July, 1823," says Professor Owen, "Mr. Clift first received information of the destruction of the Hun-

terian manuscripts. He was returning with Sir Everard Home from a meeting of the Medico-Botanical Club, which had been held at Kew. Sir Everard," Mr. Clift states, "began by telling me that an accident had very nearly occurred at his house; that it had been nearly on fire; that the engines came and the firemen insisted upon taking possession of his house. They saw the flames coming out of his chimney. He did not wish to admit them, but they insisted upon being admitted. I asked him how it happened; and then he told me it was in burning those manuscripts of Mr. Hunter." Mr. Clift thought it his duty to report this fact to the Board of the College of Surgeons, who sought from Sir Everard Home an explanation of the circumstance. They received an answer from him to the effect, that "Mr. Hunter desired that after his death his manuscripts should not be intrusted to anybody, but were to be destroyed, being in too imperfect a state for the public eye." No proof of any kind was afforded that such a thought had entered the mind of John Hunter; and it is to be feared that Home, after having plundered John Hunter's manuscripts for the purpose of obtaining materials for his own papers and lectures, determined on destroying them, lest they should afford proofs of his guilt. But the same reverential feeling which had guided the careful hand which kept the specimens in such admirable order from 1793 to 1825 had dictated a study of these manuscripts of so careful a kind that above half of them have been rescued from destruction. In his examination before the parliamentary committee on medical education, in 1834, Mr. Clift states, that having had access to the Hunterian manuscripts from 1793 to 1799, he availed himself of the opportunity of reading them and copying them. The papers now published are those copied manuscripts. Professor Owen, during the time he was preparing the Catalogue of the Museum, received from Mr. Clift, from time to time, copies of those papers, which he incorporated in the catalogue. It was not, however, till a short time before Mr. Clift's decease that he received the whole of these manuscripts, which he has arranged and published in their present form.

Professor Owen has not ventured on any commentaries of his own in the large field of comparative anatomy, physiology,

and palæontology which these papers range over. He has deemed "that the requirements of science would be best met by presenting these writings, 'pure and simple,' as Hunter left them." There is one apparent exception, and this, perhaps, a necessary one. Amongst Hunter's papers that were not destroyed by Sir Everard Home, or copied by Mr. Clift, was one on the subject of geology, with the title "On Extraneous Fossils." This paper, perhaps one of the most remarkable, in many respects, left by Hunter, was found amongst Sir Everard Home's effects, and presented by his son, Capt. Sir E. Home, B.N., to the College of Surgeons, who not only made no use of it, but most ungraciously refused their permission to Professor Owen to publish it in these volumes with the rest of Mr. Hunter's unpublished manuscripts. Under these circumstances, Professor Owen has here published two of his own lectures, delivered in the theatre of the Royal College of Surgeons in England, in 1855. Those acquainted with Hunter's obscure and abstract style will not regret that the absence of this paper from the present collection has led to the introduction of these masterly criticisms on the genius and philosophical speculations of Hunter on the subjects of geology and palæontology. But the importance and interest of this paper is too great for its history to be passed over in silence. How was it such a paper had not been published before? Here is Professor Owen's account of it:

"Part of this memoir Mr. Clift wrote out under the dictation of Hunter, chiefly from separate sheets or slips of paper, on which Hunter had doubtless, from time to time, noted down the observations he had made, and the ideas as they arose in his mind out of those observations. This constructive intellectual work was performed in the evening. Hunter having previously taken his usual hour's sleep after dinner—a sacred hour, in which he was only to be disturbed in matters of the utmost emergency. Thus refreshed, the philosopher returned to his study, and passed the hours from eight o'clock to midnight in the business of writing or dictation. The penning of the paper 'On Extraneous Fossils and their Relations,' was one of the first of Mr. Clift's evening labours after he joined Mr. Hunter's household. This manuscript completed, Hunter took it, corrected it; and as Mr. Clift believed, communicated it to the Royal Society. What followed thereupon, Mr. Clift subsequently heard from Sir Everard Home. The attention of the secretaries or council of the Royal Society had been called, by some of the Fellows, to the expressions in the first paper on the 'thousands of years' required for such and such geological phenomena; and, in the second memoir, the secretaries found that a

chronology of the earth, widely different from the usually accepted one, was more directly and emphatically affirmed by the author, as essential to the rational comprehension of the phenomena he treated of, while, at the same time, the adequacy of the chief or sole geological dynamic, at that time recognised, viz. the Mosaic Deluge, to account for the presence of marine fossils on land was called in question. Considerations for the repute and interests of the author himself may have swayed his advisers in the recommendation to him to submit the MS. to a geological friend, before finally sending it in for formal acceptance and perusal before the society. Major Rennell, author of some papers in the 'Philosophical Transactions' on 'Tides and Currents,' and other geographical subjects, undertook the delicate task of submitting to Hunter the misgivings of the authorities mainly responsible for the publications of the Royal Society. He did it in these words:—"This leads me to remark that, in page 3, you have used the term 'many thousand centuries,' which brings us almost to the *yogues* of the Hindoos. Now, although I have no quarrel with any opinions relating to the antiquity of the globe, yet there are a description of persons very numerous and very respectable in every point but their pardonable superstitions, who will dislike any mention of a specific period that ascends beyond 6000 years; I would, therefore, with submission, qualify the expression by many thousand *years*, instead of *centuries*." Hunter would not modify his statements, and he withdrew the paper. If this be the correct history of what took place in reference to probably the last, and certainly most interesting of Hunter's writings—and I give it literally as I received it, and as I know Mr. Clift implicitly believed it—what a striking illustration it affords of the immense progress in geological science which has been achieved between the date of Hunter's demise (1793) and the publication of Buckland's 'Bridgewater Treatise,' 1836! What a cheering evidence it affords of the influence of natural truth on the receptive mental faculties of mankind; and how remarkably it exemplifies the degree in which John Hunter had surpassed, not merely his own age, but the élite of it, viz. certain of his scientific contemporaries and fellow-labourers in the society expressly founded for the promotion of Natural Knowledge!"

In his third lecture on this wonderful paper, Professor Owen dwells on the special views held by Hunter, and shows how far ahead he was of all his contemporaries, not only in his anatomical knowledge of fossils, but in his general views of the structure and the formation of the earth. At a time when the most advanced geologists were contending for great cataclysmic changes, in order to explain the phenomena of stratification, or referring all to the Noachian deluge, Hunter was maintaining the permanency of the laws of nature, and the necessity of explaining all phenomena by the action of causes at present in existence. Although not a traveller, we have evidence in this paper of how Hunter availed himself of his limited opportunities for observation. It ap-

pears that during his short sojourn with the army at Belleisle, he not only laid the foundation of his great work 'On Inflammation and Gunshot Wounds,' but that he made observations on the geological structure of the district, and has adduced many of the facts he had thus observed in support of his geological views. From this and his other papers we may gather that Hunter fully recognised the importance of studying fossil remains, not only as they threw light on the history of the surface of the earth, but as they explained the structure and relations of existing animals. Such was his object in collecting fossil remains, and an explanation of the reason of their presence side by side with the recent animals in his museum.

But we now come to speak more particularly of the papers which have for the first time in these volumes seen the light. They do not bear the character of a consecutively written work, but are probably a collection of materials which, had the life of Hunter been spared, he had intended to embody in a great work on natural history and physiology. In this case the museum would have been an illustration to the work, and the name of Hunter would have been probably better known by his book than his museum. As to the form these documents would have assumed in Hunter's own hand, it is impossible to say; but no one can deny the judgment with which they have been arranged by his editor. In the first place, we have a series of papers arranged as an "Introduction to Natural History," including the consideration of such questions as the Origin of Species. And here many a student will stop to inquire what the great anatomist's opinion was on this subject. For the benefit of such, we give the following short extract:

"To attempt to trace any natural production to its origin, or its first production, is ridiculous; for it goes back to that period, if ever such existed, of which we can form no idea, viz., the beginning of time. But, I think, we have reason to suppose there was a period in time in which every species of natural production was the same; there then being no variety in any species; but the variations taking place on the surface of the earth, such as the earth and water changing situations, which is obvious; as also the change in the poles or ecliptic, which I think is also obvious. The varieties (so produced) are but few, and are still existing in what may be called the 'Natural' Animal. Also civilization has made varieties in many species, and without number, which are the 'Domesticated.'"

We are afraid that neither party in the present controversy will gain much support here; but the opening passage is

striking, as the conviction of one who was untiring in his investigations to unravel the secrets of existence.

In this introduction we see the philosophical character of Hunter's mind; we see, above all, his freedom from the one-sidedness which has been the bane of the schools of surgery which have been proud to call themselves his disciples. From his observations on matter and its chemical properties, and the influence these exercised on life, we see that he was prepared to carry into his physiology an amount of causation from those agents which his immediate followers, who cited him as their master in the doctrine of the exclusive agency of a vital principle, would scarcely have allowed.

We are struck, too, in these volumes with the importance Hunter attached to the study of vegetable physiology. In his day he saw the fallacy of the botanist who regarded the plant as a kind of fallen animal, and attributed to it all sorts of imperfect animal functions. He saw in the plant a simpler organism than the animal, and studied its functions with a view to throw light on the more complicated structure of the higher being. Many of the experiments recorded under the head of "Observations on Phytology," we do not remember to have seen before, and afford matter for interesting thought on the functions of plants.

Passing from general principles to details, we arrive at a "Classification of Animals," and here we have the various forms of animals, grouped according to the characters of their various organs. This division is followed by a series of interesting notes on the natural history of man and the lower animals. Many of these observations are new, and will be found of interest to the student of systematic natural history.

This section is followed by a series of "Observations on Physiology." These will be read with more interest as a record of Hunter's opinions than for any additional matter they can supply now to the great science of animal physiology. No physiologist, however, will fail to read them with interest, both as indicating the progress of his science and revealing the efforts of a great mind to discover the laws of life. The papers here are not confined to the functions of organic life, but embrace a number of observations, more or less interesting, on psychological phe-

nomena. These are isolated observations, arranged under various heads, and probably intended as a body of facts on which to raise the superstructure of a physiology of the human mind.

The subject of development was not one likely to escape Hunter's attention; and every one acquainted with the preparations in his museum will know how fully this subject is illustrated. Some of the papers printed in these volumes have already appeared in the catalogue; but there is a great number of papers here on monsters, and the laws of their development, which will not fail to interest the teratologist, and to supply him with new facts for confirming the permanence of the laws according to which monstrosities are produced.

The contents of the second volume of these papers is principally devoted to dissections of the higher animals. Many of these animals are still to be found in the museum, and these notes will remain as a permanent record of important facts, and a memorial of the immense industry of their writer. In perusing these papers one is forcibly reminded of the enormous labour which such work has entailed; and when it is recollected that all this was done as a naturalist and a physiologist, by a man who had the greatest reputation and the largest practice of his day as a surgeon, who lectured daily on surgery for many years, and published many surgical works; we feel not only impressed with the prodigious activity of his mind, but with the herculean frame he must have possessed to have got through the mere physical drudgery of his work. He suffered, however, from his work, and, like the over-wrought race-horse, died in the heat of his race. What more John Hunter would have achieved had he lived, it is impossible to say; but we feel from the character of these fragments that, had he been spared, he would have placed himself before the world, much more decidedly than he has done, as a philosophic naturalist. He would have been much more clearly apprehended as the profound student of the laws of life; and his reputation would have struck men, not as the great surgeon, or the great anatomist, but as the greatest exponent of the laws which regulate the succession and existence of organic beings, that the world has yet seen.

Dental News and Critical Reports.

THE ODONTOLOGICAL SOCIETY.

THE MONTHLY MEETING of the Members of this Society took place at their Rooms, 32, Soho Square, on Monday evening, March 4th, 1861.

WILLIAM MINSHULL BIGG, Esq., President, in the chair.

The minutes of the last meeting having been read and approved,

MR. DREW said,—Mr. President, I think it of some importance to the members of the Society generally, to have a point settled with regard to the treatment of vulcanite as applied to the gums. I have two cases of my own, in my hand, which illustrate the fallacy of using the gum-colour rubber, so far as we know at present. In these cases the gum-colour has fluxed through the vulcanite, and the pins have yielded. I think where patients go abroad, or where they cannot get their pieces repaired, it is important to us that we should avoid the use of it until we know more of its nature. There are other objections to it; one, is its liability to blacken under peculiar circumstances. That may not be of great importance, perhaps, but I think it is still an objection. I think, on looking at the incisors, you will very soon perceive the pins have not been weakened, yet upon a little pressure being applied the teeth move at the front, and cause a roughness inside, and we all know what the effect of the rough edges is to the patient. I think we ought not to use it. If you will allow me I will pass them round.

The following gentlemen having been balloted for, were then announced as elected members:—Messrs. Cassons, of York, and Edwin Freeman, of Old Burlington Street.

Messrs. Charles Edward Stewart, 59, Bold Street, Liverpool, and Henry Howard Hayward, 56, Queen Ann Street, were announced as candidates for election as members of the Society.

Mr. Bridgman, of Norwich, then read the following paper on

Caries and its Treatment.

THERE are few points connected with the practice of dental surgery which have

given rise to so much conflicting opinion as the cause of decay.

Its precise nature and origin have long been a disputed question. It has been regarded, by one section of the profession, *not as disease*, but as being entirely due to the effects of *external chemical action*—that is, produced by the solvent power and corroding effects of some acid, generated in decaying food, lodged between and around the necks of the teeth, and finding access to the dentine, through natural or artificial openings in the enamel.

Another section, viewing the teeth as organic bodies, having a strong analogy to ordinary bone, consider decay as a disease, resulting from morbid action upon a vitalised organization.

It is scarcely necessary to observe that these hypotheses, neither separately nor combined, are sufficient to account for decay in all its various phases; and that some further explanation is needed to satisfy the main bulk of the profession.

When these views were first promulgated, so little, comparatively, was known of the minute anatomy of the organs, and histological science all but unknown, that whatever opinions were held on the subject could only be little more than mere conjecture.

Our knowledge of the true structure of the teeth dates back but a very few years. The re-discovery of the dentinal tubes by Professor Retzius, of Stockholm, within the last thirty years, may be said to have been the commencement of a new era in the study of dental physiology. I say the re-discovery of the dentinal tubes, because, from a paper in the 'Philosophical Transactions' for 1678, it would seem that these were first observed by the celebrated Leuwenhoeck; but as the lenses employed were simply minute globules, melted from the end of a fine glass thread, and far more difficult to use than to make, there would be but few observers, and consequently, the discovery appears very soon to have been lost sight of. On the introduction of the instrument in a more improved form, we had the announcement of the above re-discovery as one of its earliest results. The extraordinary degree of perfection to which

the achromatic microscope has now been brought not only enables us to verify this discovery, but also even to determine the construction of the tubes and the materials which bind them together. In addition to this, it has fallen to the lot of one of the founders of this Society to be the first to announce the nature of the *contents* of these tubes, and to point out their evident connexion with the central pulp, thus tending, in some measure, to confirm the opinions of those of our predecessors, who, although unable to establish the *fact* of *vascularity*, as commonly understood, were evidently convinced of an arrangement existing which so nearly resembled that of other bones as to merit the same title.

If we turn to the writings of Hunter, we shall find this great physiologist, although compelled by the result of his experiments with madder, to admit "tooth-bone" to be unlike ordinary bone, was yet unwilling to give up the idea of the teeth being vascular, and concludes by observing "*that they have most certainly a living principle, by which means they make part of the body, and are capable of uniting with any part of a living body.*"

Five and twenty years later, we find his successor, Fox, ignoring the result of these experiments, and boldly maintaining that, from their vascularity, the teeth were similar to bone, and differed only in being denser and having their exposed surface covered with enamel.

Dr. Blake, too, in 1801, in stating his opinion, says that vessels, both "circulatory" and others, are present in the tooth, and that minute vessels pass into the ivory. That the teeth are both osseous and vascular is also asserted by Professor Bell, and who further states that there is a vascular communication maintained between the pulp and the ivory. Thus, from the time of Ambrose Paré, in the latter half of the sixteenth century, to that of the author last named, we have a period of near 300 years in which this belief, with but few exceptions, will be found to have been the prevailing one. And, believing the teeth to bear so close a resemblance to ordinary bone, it is but natural that the diseases of the one should be considered analogous to those of the other, and that, as true bones are subject to inflammation, the bone of the teeth should be so likewise, and therefore that gangrene, or mortification, or suppuration, should be the result.

When, however, it came to be noticed that the tubes of the dentine were too

small to admit the passage of the red corpuscles of the blood, and consequently believed that there could be no true inflammation, according to the true acceptance of the term, which implies *heat, redness, and swelling*, its probability, or even its possibility, began to be doubted, and other suggestions were then made as to the probable origin of decay. The constant presence of acidity in softened dentine, together with the disappearance of its earthy constituents, must necessarily lead to the detection of the acid being the cause of decalcification. And that it might arise from decaying food would also present itself as the most feasible solution of its source, but it has never yet been shown how it would be accomplished. On a superficial view, it may seem extremely plausible; but on a closer investigation, it will be found to be quite as untenable as its predecessor. But as we have to consider the several components of the teeth in their elementary form, it will be needful to see in what their peculiarities consist, and how far each one can lay claim to the possession of *vitality*.

We must first, however, ascertain the conditions and appearances which are supposed to indicate the *possession* of vitality, and then see what are the laws and attributes of *vitality* itself.

If, on paying a visit to the seashore, we pick up a pebble and examine it closely, both inside and out, although we might find it to contain traces of once living forms imbedded in its substance, we should soon come to the conclusion that the stone itself had never been possessed of vitality. If, on the other hand, we were to direct our attention in a similar manner to a piece of water-worn shell, we might possibly be at a loss to form an opinion; but if, instead, we light upon a piece of *Fucus vesiculosus* or any of the larger seaweeds, we should unhesitatingly pronounce for organization and a living existence. If we inquire the reason, we find it at once in its structural arrangement—in the apparent presence or absence in its interior of *cell-formation*—that is, of cells or their derivatives.

This cell-structure, whether it exist in the plant or the animal, is looked upon as the basis of organization, and any form having it is known to possess organization. This in the seaweed is unmistakable, in the shell obscure, and requiring peculiar manipulation to make apparent, and even so it is rendered doubtful whether such appearances

are not due to some other source. We have been accustomed to consider the solid constituents of shell and bone as consisting of these cells calcified, that is, formed first in the ordinary way, and then subsequently rendered solid by being filled up with their earthy contents, so as to form a dense and compact mass. This supposition is now likely to be set aside through the beautiful experiments of Mr. Rainey. In his work on 'The Mode of Formation of Shells of Animals and of Bones, &c.,' the writer observes, "that by a proper employment of chemical and mechanical means, and by an exact adjustment of the condition under which they act, calcareous bodies, identical in structure and similar in composition to the elementary forms of the structures above mentioned, can be artificially produced," and "that wherever natural products are found identical in structure with the artificial ones, the existence of *physical* and *chemical* conditions, similar to those associated in the artificial process, can be demonstrated."

To produce these calcareous globules, or artificial calculi, some mucilage of gum arabic, containing a solution of carbonate of potash, and another portion of simple mucilage in water, are placed one above the other in a small phial, so that the lighter one may float above the denser, and the two becoming mixed gradually, give rise to a slow decomposition, which results in the formation of the bodies in question where the two fluids meet.

"From this process there results the simple, though very important, fact, that when the carbonate of lime thus formed is in a viscid material, its form, in the place of being crystalline, as when produced in the same manner in pure or common water, is globular, and possesses in a remarkable manner the property of coalescing with contiguous particles of the same compound, as well as of intimately blending with such substances as, in its molecular state, it may happen to be brought into contact with." But, says the same author, "the animal basis left after the decalcification of bones and shells has generally been regarded as a proof of their vital origin;" therefore it is contended "that, as exactly the same effect is produced by a like treatment of *artificial* calculi formed in a solution of *albumen* in the place of gum, this can no longer be considered as an infallible test of an organic formation."

Hence, by the advocates of the external

chemical action theory and non-vitality of the dentine, this theory will be taken as conclusive evidence in favour of their own views; but a closer consideration of the subject will show that it does not alter the position in that respect in the slightest degree, for whether we grant the solid material of the bone to be formed by molecular coalescence, as propounded by Mr. Rainey, and thus owe its origin wholly to physical action, or whether we abide by the cell-development theory, and attribute its solidity to the transformation of cell-contents, the main features of the case remain identically the same.

We have a definite amount of an organic body intermixed with an *inorganic* and crystalline substance of a peculiar character, for the specific purpose of rendering it hard enough to withstand the mechanical action of mastication. Now, whether we consider the crystalline element as filling a previously prepared envelope, or whether we admit the membrane and the crystals to be formed simultaneously, it is perfectly immaterial, as regards the possession of vitality by the substances in question, for no difference in arrangement, or in external appearance can in any way interfere with its still remaining an *organic*, or, in other words, a *vital*, body.

In the error of confounding *vitality* with *vital activity* or *vital action*, all the mystery and confusion regarding the vitality of dentine would seem to have had its origin, and than which nothing can be more separate and decided.

"If we take a portion of albumen from the egg," says the author of "Physiological Riddles," in the 'Cornhill Magazine,' "it is a vital substance. It possesses life. Yet it possesses no power of performing actions. It has no defined shape, and has not even any kind of structure; nevertheless, it is living, and that which constitutes it living is the mode in which its elements are combined. It consists mainly of three gases (hydrogen, oxygen, and nitrogen), and one solid (carbon), with small quantities of other bodies, of which the chief are sulphur, phosphorus, and lime. But these elements are not arranged according to their ordinary affinities. Exposed to the air, albumen decays, the carbon unites with oxygen to form carbonic acid, the hydrogen unites with oxygen and forms water, and with nitrogen to form ammonia. Similarly, the sulphur and phosphorus select some other ingredients of the albumen, or of the atmosphere, to unite with them into simple

compounds. In time the process is complete, and from being an organic substance the albumen has wholly passed into a variety of inorganic substances. In doing so it has given out a certain amount of force, chiefly in the form of heat; and this force, if the albumen had formed part of a muscle or a nerve, would have been operative in the function of the same. Now, it is on account of this force which is in the albumen, and is not in the inorganic substances which are formed by its decay, that it is called *organic*." Now, "this albumen," says Dr. Carpenter, in his 'Animal Physiology,' "is the very basis of all animal structures, and the great source from which they are formed and nourished, and appears to perform in the animal economy a part precisely corresponding to that of gum in the vegetable." But it may exist in two states, the soluble and the insoluble. In the egg and in blood it is associated with one and a half per cent. of soda, and it is the presence of a small quantity of alkali which is supposed to render it soluble; for on the abstraction of this, or on neutralizing it with an acid, the albumen is precipitated in its insoluble form. Hence it is easy to foresee how, at the point where chemical decomposition may be going on in its solution, and neutral crystals forming as one of its results, this albumen, precipitated in its insoluble form, may become entangled in their formation, and so constitute what is termed the "*basement membrane*" of the substance.

The first change which can be traced in albumen is in its assuming a tendency to *spontaneous* coagulation when withdrawn from the living body, and in the traces of organization which are presented in the coagulum or clot.

The part separated is *fibrin*, from its assuming the appearance of fibres, "But," says Dr. Carpenter, "it appears that fibrin may be consolidated, not merely into fibres, but also into very thin layers of membrane, in which no traces of *structure* can be perceived. Such a membrane is found covering every free surface of the body, both external and internal. *It forms the outer layer of the true skin, lying between it and the scarf skin.*" "It may be obtained, too, from any shell, by dissolving away the mineral portion with an acid. Such a combination of membrane and mineral matter forms the whole thickness of many shells, and the inner layer of all." "This membrane is termed the *basement* or *primary* membrane, and, like the elementary mem-

brane in plants, it is remarkable for the readiness with which it is permeated by fluid, though no visible pores can be seen in it."

This same membrane, which so forms the whole thickness of many shells, also forms the basis of dentine. Human dentine contains about from twenty to twenty-eight parts in every hundred of it, and the enamel about three parts in a hundred. Specimens from each, that is, from dentine, bone, and shell, are placed side by side on one of the cards before you. Now, as all simple membranes and fibrous tissues are concerned in actions purely mechanical, and are amongst the lowest forms of animal tissue, this membrane, having no special vital *action*, being merely a mechanical agent in the fabric of the tooth, can be regarded as *vital* only in virtue of its being an *organic* or *vital* substance.

Hitherto we have confined our remarks to the dentine exclusively as an organic body. We have now to consider it in its relation to the tooth as a vitalised organization.

That the pulp of a tooth is a living body, capable of performing vital actions, is a fact not to be disputed; and that it must also have been placed there for some special advantage to the tooth, during its active existence, will scarcely admit of a doubt. Yet, when it has been lost, a tooth which has had its place supplied by a successful stopping is calculated to continue quite as long in this state as with the pulp remaining. Therefore the pulp cannot be said to be essential to the tooth's existence, nor can it be said that a tooth will be more effective *with* than *without* it, for if solid, it would be equally useful so far as the mere mechanical action is concerned. Hence, were the teeth intended to be mere mechanical agents in the mouth, like the particles of diamond in the stone-cutter's wheel, there would have been no need for this beautiful fabric of living structure in their interior; therefore it must have some other function than that of nutriment to the dentine; and what so likely as that of endowing the part with sensation? Are not we conscious of the slightest touch upon these organs? And whence, then, this delicacy of perception but through the fine branches of the nerve ramifying in their interior? Seeing that it is not needed for the tooth's existence, nor capable of casting off any portion of its dead or dying exterior shell, it is but a just conclusion that its main purport should be for

providing a certain amount of feeling in the crowns of the teeth.

It is said that the teeth are "*dermal appendages*." They are more than this. They are a portion of the cutaneous system itself. In the skin we have, first, the epidermis or cuticle, immediately beneath this a layer of basement membrane, and below that the cutis vera, or true skin. This is composed mainly of white fibrous tissue, interspersed largely with blood-vessels and nerves. Its surface is elevated in many parts into papillæ and ridges. These papillæ are specially organized for delicacy of feeling, and abound most in those parts in which the greatest acuteness of sensation resides.

In the human tooth we have precisely the same arrangement of parts, though considerably modified to suit the altered requirements. The pulp represents the cutis vera or sensitive skin, and has its full share of nerves and blood-vessels. The dentinal fibrils of Tomes form an equivalent for the papillæ of the cutis. The basement membrane, which in the skin is aided by the mucous layer of the epidermis, in forming a layer of sufficient thickness to shield their delicate extremities and support them against the effects of too much pressure, in the tooth forms the whole, or nearly so, of this protecting shield. It is further aided in this respect by the additional hardness gained from its intermixture with an earthy basis. In the skin we have the outermost layer of all forming a tough and elastic substance, capable of yielding to every movement of the subjacent muscles and joints, and "appears," says Dr. Carpenter, "solely destined for the protection of the true skin from mechanical injury and the pain occasioned by the slightest abrasion, and from the irritating influence of exposure to air, and of changes of temperature; we perceive the value of this protection when it has been accidentally destroyed." In the tooth, on its crown the enamel, and on the fangs the cementum take the place of this horny layer of epidermis upon the skin. But as an elastic and yielding surface upon an inelastic and unyielding surface of dentine would be out of place, elasticity has been superseded by extreme density; and hence we have one of the hardest of all known animal structures, and one well suited to its office. On splitting off a portion of this from a living tooth, or on drilling through it, the exquisite sensitiveness of the underlying dentine, as in removing the covering

from the sensitive skin, is equally a reminder of the value of the enamel as a protective covering.

The persistent capsule of Nasmyth would seem to be neither more nor less than a layer of basement membrane formed between the secreting surface and the crystals of enamel to which it is adherent, and in some degree continuous with and identical with the inner layer of membrane which can be separated by means of an acid from the interior of all shells; and whether this be the capsule, or any membrane concerned in the production of the enamel, is best answered by a reference to the mollusca, and a suggestion as to whether, in that case, the membrane forms part of the mantle or other portion of the animal by whose instrumentality it is formed. The answer would be decidedly not, and I can see no reason to doubt the identity of the other as a like production.

Respecting the office of the dentinal fibrils, a paper in the 'Philosophical Transactions' for 1850, "On the Structure of the *Dental Tissues* of the Order Rodentia," by Mr. Tomes, will afford a convincing proof that there is method and order in the course of the dentinal tubes; and there is little reason to doubt but that in those instances in which these are carried into the enamel, it is to bring the sensitive ends of the dentinal papillæ by which the tubes are filled nearer the surface, so as to obtain more acuteness of feeling, and at the same time secure sufficient strength in the enamel for its purpose of resistance. That such is the intention and use of the tubes and their contents is further borne out by the fact that where the incisors are formed *upon*, but not *around*, the pulp, and increase in length by age, protruding from the jaws so as to partake more of the nature of weapons than teeth, we see the tubes and their contents in the exposed part dispensed with and supplanted by solid material; thus doing away with the power of feeling, which would, under such circumstances, be in some measure detrimental to them as implements of warfare.

The extension of the fibrils into the enamel is a still nearer approach to the arrangement of their prototypes; in the skin the papillæ pass up into the lower half of the outer layer of epidermis in the same manner, and thus show a correspondence of contrivance equally, it must be supposed, for a similar purpose.

In the early stage of the tooth, its first indication of growth "is a slight projection

of the mucous membrane, which soon increases in size, and forms a papilla. This papilla is the primary condition of the tooth-pulp." Hence, as the mucous membrane is identical in structure with the external skin, and the pulp of the tooth a portion of it, we see at once, in its origin, its identity of parts as the framework of the subsequent structure, where each one has been so altered and adapted to a specific end, as to gain for the whole a peculiar and suitable condition for its purpose. Nor is this change, by alteration of circumstance, in the condition of the components of the tooth without its parallel; for we have an analogous case in the skin becoming mucous membrane and mucous membrane taking on the condition of the external skin when transposed from the position of the one to that of the other.

Such, then, being the principal features of the several elementary portions of the tooth, we are now prepared to consider that abnormal condition of the dentine known as decay, and to investigate the various actions and conditions of matter leading to its production.

In the composition of dentine we have about one fourth consisting of an *organic* substance, and as all organic matter is held together as such, in a peculiar combination known as "*vital*," which, when overpowered by chemical affinity, gives rise to inorganic resultants, that the organic basis of dentine should be subservient to the general law is but a just inference; therefore, if we apply to the dentine the same principles of change which are known to take place in other organic bodies, we certainly should not be other than justified in expecting corresponding results.

This chemical transference of elements is best illustrated by ordinary combustion with heat. Thus, if a match or a piece of paper be set on fire, it will go on burning and leave a blackened ash as a residuum. The ligneous fibre of which both these are composed is an organic substance; it consists of hydrogen, oxygen, and carbon, the two former gases, and the latter a solid. The two gases are in the proportion to form water, but are here united with carbon in a manner which defies the synthetic powers of the chemist to imitate. Man may even make organic bodies. He may effect numerous changes and combinations in organic elements, and produce various forms and substances of different aspects and properties; but it is the Creator alone who can make that organic material and endow

it with that condition which is indispensable for its increase and extension. In the destruction of this material by the process of burning, the elevation of temperature destroys the attraction of the vital force which keeps together the combination, and chemical affinity then causes the separation of its elements, inducing the two gases to combine and form water, while the greater portion of the carbon is left as ordinary charcoal. But heat is not the only agent capable of effecting this change. Concentrated sulphuric acid has so great an affinity for water that it will deprive an organic body of the elements of this compound, and become discoloured by the resulting charcoal. Other substances will have a similar effect. It occurs also as a natural process. In rotting wood we have an instance of it. It is, in fact, one of the ordinary modes by which once living matter returns to the inorganic world.

If we burn a feather or a piece of animal membrane, we have, in addition, a disagreeable odour, arising from the sulphur and phosphorus in combination with its nitrogenous compounds, but in other respects the change is precisely the same; and as discoloration is one of the natural consequences of dead organic matter, whether vegetable or animal, undergoing its ordinary course of conversion in a comparatively dry state, we may reasonably look for discoloration in decaying dentine. Such, indeed, is commonly the case, and is often the first and only sign by which we know that the death of the part has taken place.

Whenever this discoloration occurs upon the crown of a tooth, and has taken place slowly, a section of the part invariably shows its direction to be toward the central cavity.

The texture, too, for some time retains its original firmness. It is one of those phases of decay which it is wholly impossible to explain by the external action of an acid. In the three specimens,* marked A, B, and C, of No. 1 card, we have a notch at the neck of each. In all these a discoloured spot will be seen in the centre of the notch. Now, had these spots been produced by the aid of an acid, the surface, as seen by reflection, must have shown a roughened outline instead of the high polish it now bears. It is only by the organic death and decomposition of the membranous part of the dentine that it can be satisfactorily accounted for.

Mr. Tomes defines decay as "*the death*"

* The specimens here and subsequently referred to are shown in the Society's Museum.

and subsequent progressive decomposition of a part or the whole of a tooth."

Hunter remarks that "the simple death of the part would produce but little effect, as we find the teeth are not subject to putrefaction after death; and therefore," says this great physiologist, "I am apt to suspect that during life there is some operation going on which produces a change in the diseased part." The change here alluded to *does* take place, and may be thus explained.

In Fownes' 'Manual of Elementary Chemistry' it is stated that "Azotized albuminous substances, which, in a more advanced state of putrefactive change, act as alcohol ferments, often possess, at an earlier period of decay, the property of inducing an acid fermentation in sugar, the consequence of which is the conversion of that substance into *lactic acid*;" and, again, that "*moist animal membranes in a slightly decaying condition often act energetically in developing lactic acid.*"

Now, as so large a proportion of our food contains sugar, or substances capable of being converted into it, and "*the moist animal membrane in a slightly decaying condition*" being provided by the dead portion of dentine, we have thus brought together under the most favorable circumstances the elements requisite for the production of an acid. Respecting this compound, Professor Brande says, "lactic acid has a considerable solvent power over phosphate of lime;" therefore we have not only the production of an acid, but the formation of one capable of dissolving out the earthy constituents of the dentine. But there is here one condition requiring especial notice. Moisture is so essential to chemical action that few chemical changes can occur in its absence; thus, while the dead membrane can remain comparatively dry, it is able to resist this change; but so soon as it becomes charged with additional moisture, the change suspected by Hunter will speedily follow.

There is a specimen before you which fully exemplifies this power of resisting the change when kept dry. It is a molar tooth stopped by Woodcock upwards of twenty years previously to its coming into my possession. The discolored dentine between the stopping and the central cavity being the remaining portion of the radial strip of which the plug forms the base of the cone, most unquestionably formed part of the original mischief, although possibly it might be but little discolored at the time. Through

having been kept dry, it has been prevented from undergoing this change. It also illustrates the fact that this stage of decay is only progressive toward the central cavity; and that it is not until the acid is produced that a cavity is formed and becomes enlarged in every direction. The acid, being generated within the moist membrane containing the crystalline matter, is thus brought into immediate proximity with the part to be dissolved, and the decalcification of the softened stratum rapidly succeeds. Mr. Tomes says, "It might be supposed that similar results would be produced from decalcifying a tooth by the aid of a dilute mineral acid; such, however, has not been the case in experiments instituted with the view of determining the point. Indeed," says the author of the manual, "I know of no artificial means whereby the appearances which have been described can be as fully brought out as by the progress of disease;" and further, "The connecting material is usually the first, and the walls of the tubes the last, to become disintegrated." We have in these facts a corroborative proof that the acid solvent must be in some way differently circumstanced to an ordinary external solvent, and, by the latter fact, a proof that it cannot be provided through the dentinal tubes; hence it is obvious that it must be through some change in the intertubular substance that the solvent is enabled to find access; and in accounting for the presence of the acid in the present manner, facts and theory fully coincide.

The intensity of colour in decaying dentine depends wholly upon the length of time occupied in its production. Hence, when the combustion has had time to be completed, a charcoal blackness may result, while, if acidity commence before this stage has been attained, any shade of brown may be produced. When acidity commences at the very outset, which it may do from mechanical injury to the surface, the disrupted part may remain almost colourless; and when the texture has been broken up, and insufficient acid generated to dissolve the whole of the lime so displaced, we have that state of decay known as "chalky" or "friable."

The uniformly acid state of decalcified dentine when first removed from the tooth, together with the equally acid condition of the accumulated food beneath the plates and frames of artificial dentures, in the absence of a knowledge of the previously

mentioned facts in chemical science, would naturally be attributed to the decaying of the food itself, and consequently lead to the supposition that extra cleanliness might *prevent decay*. The real source of the acid, however, in this accumulated food, may be traced to a similar cause to that in the dentine.

The epithelium of the mucous membrane of the mouth, like the epidermis of the skin, is constantly shedding its outer layer of worn-out or used-up cells, and the membrane of these cells is also liable to the same change as the membrane of the dentine. A trace of the effects of acid so generated may often be seen on the approximal sides and lingual surfaces of aged incisors. But we have another and far more marked illustration of its effects. We often see the necks and upper edge of the enamel much corroded in the upper incisors. The epithelial cells, rubbed off from the gum and inner surface of the upper lip, are wiped by the action of the lip into the groove formed at the junction of the gum with the tooth, and there being allowed to remain, soon generate sufficient acid to destroy the surface and texture of the enamel. But everything connected with this is so thoroughly different, that it is scarcely possible for it to be mistaken for ordinary decay. The roughened surface, the green tinge of the discoloration, and its superficial and spreading character, all indicate the action of an external agent as opposed to the usual signs of decay.

From the existence of this source of an acid menstruum, the question which will now arise is, how we are to determine the limits of its action; and whether the decay occurring at the necks of the teeth may not arise from the same cause. A close and careful attention to the facts will, I think, sufficiently guide us in this discrimination. A stained spot and the absence of external roughness are sure indications against it; for discoloration under the action of an acid is always, *not* as in ordinary decay, its *antecedent*, but invariably a *subsequent* result. The large patches of decay occurring at the necks and on the exposed fangs of denuded teeth are mostly attributed to this source, but unjustly so. We must not overlook the fact that in this case the dentine is not in its normal state. It has lost its protective covering. It was never intended for exposure, even to so much as the moisture of the mouth. And it is not impossible that the latter may prove as much a source of irritation, and as

much an enemy, as the acid. But we have here No. 2 card—a specimen which speaks volumes upon the subject, affording a far more substantial proof of *non-external acid action* than anything which can be said on the subject. It is a lower incisor largely coated with tartar. On one side (*A*), beneath the upper edge of the tartar, appears the edge of a stained spot, upon which the tartar yet remains.

On the other side (*B*) is a large, shallow cavity, bearing the most palpable evidence of strong acid action both within and around it, while the subjacent tartar has been dissolved off through the acid fluid running down on to it. *C* and *D* are further illustrations of this.

From this contrast it is unmistakable that, had *exterior* acid existed and been the exciting agent, the one side would *not* have been *still covered over with tartar*, while the other bore such strong traces of its action.

The whole appearance of the tooth is that of age. The covered-up side bears the peculiar mark of a dead and decaying animal substance prior to the formation of the acid solvent. The other side as forcibly illustrates, by the course it has taken, the source of the acid; and its being produced at the cavity, consequently, implies the aid of the dead membrane in its production.

The decay of all animal substances, when used for artificial dentures, has always been instanced as a strong proof of decay being produced by the fluids of the mouth, because when covered over with tartar they usually remain intact. But as it is equally so wherever friction has kept the part polished, the inference is not altogether correct. The fact is, that, under every circumstance, these substances will be found to conform to the same laws, in every respect, as pertain to the human dentine in its natural state. The material is an organic substance. It is subject to the same kind of death as all vital bodies. Its membrane, under similar circumstances, develops lactic acid, which leads to the same results in the one as in the other. The same mechanical states affect the durability of both. Soft substances are rapidly softened and destroyed, while hard ones resist softening for a longer period. Soft bodies generate acid speedily, while the harder ones show the tinge of departing life. This is well illustrated by the walrus and hippopotamus ivory, which vary very much in density; some decaying at once, while

others last for many years, with little or no signs of decay, thus proving the fact that the denser the dentine the longer it will last in the mouth.

It has been supposed that a living body possesses some *vital principle* which enables it to resist, in some measure, external chemical action, and the solution of the stomach after death into holes by the gastric juice has been instanced in proof of the power of a living organ to defy such action during its lifetime; but this immunity is more justly to be assigned to the protecting influence of the secreted mucus, which ceases to be produced so soon as life has become extinct.

"The existence of a distinct *vital principle* was formerly believed in by the early physiologists. The idea was, that if this principle quitted the body, the result was death; that it animated, directed, formed the body, preserved it from the effects of chemical action, and on quitting it, left it a prey to this destructive action, which was manifested by its dissolution." The belief in such a *principle* has long since been discarded, and that which now takes its place is being explained as consisting of a *vital force*.

It is supposed that this vital force, which makes albumen out of elements having a tendency to form other combinations, is given out when the albumen dies, and manifests itself in some way or other—that is, either by producing future growths or some one or more of the physical forces.

Professor Grove, in his 'Correlation of the Physical Forces,' has endeavoured to show that the various affections of matter which constitute the main objects of experimental physics, viz., heat, light, electricity, magnetism, chemical affinity, and motion, are all correlative, or have a reciprocal dependence. That neither, taken abstractedly, can be said to be the essential or the proximate cause of the others, but that either may, as a force, produce the others. Thus heat may, mediately or immediately, produce electricity, electricity may produce heat, and so of the rest, each emerging itself as the force it produces becomes developed; and that the same must hold good of the other forces, *it being an irresistible inference that a force cannot originate otherwise than by generation from some antecedent force or forces.*" It is thus that all the forces developed in the animal system, such as heat, motion, electricity, chemical action, &c., are believed to spring from the vital force. Dr. Carpenter,

enlarging upon the idea of Professor Grove, endeavours to show "that *the same relation* (in whatever way defined) exists among the several vital forces, whose operations may be traced in living bodies, as exists among the physical; and that the vital and physical forces are themselves connected by a similar relationship." Thus, whenever any force becomes manifested, it is at the expense of, or by the death of, some particular part of the organism. And whenever any particular force is required of any particular part or organ, it is so constructed as to be able to give out this force, and have its parts reconstructed at the same time, so as to keep up the supply. Hence, as all parts are so constructed relatively to the amount of vital action they are called upon to perform, so, consequently, is the amount of vital activity of any part proportioned to its construction.

"We have," says Dr. Carpenter, "evidence in the phenomena of nervous action, that the production of nerve force, like the development of muscular power, involves the degeneration and death of a certain amount of the tissue which serves as its instrument; so that we are furnished by this fact with an additional reason for the belief that nervous agency is to be regarded as but a peculiar *modus operandi* of the same force as that which is elsewhere operative in cell-development." Hence, as all sensation is the manifestation of nerve force, and the latter, produced by the death of cell-nuclei at the peripheral extremities of the nerve, and all nerves requiring a supply of oxygenated blood for their maintenance, we see in the pulp of the tooth only a necessary organization for the power of feeling, and which is the only normal function that can be recognised as its fulfilling. For that of furnishing new solid matter in the production of secondary dentine, and the consequent change in its own form, must be acknowledged as more strictly pertaining to its *abnormal* condition, and to be a step taken wholly with a view to screen and protect itself from the noxious influence of contiguous irritants.

In considering this subject we have to keep in view the existence of three separate forms of matter.

1st, an organic material; 2dly, an organic body; and 3dly, an organized condition or vitalized organization.

1st, an organic material, as gum or albumen, out of which organic bodies are made.

2dly, an organic body, when the organic

material assumes a definite shape, but possesses none other than the ordinary physical properties pertaining to matter generally, and which may be formed either *in* or *out* of the system.

3dly, a vitalized organization, or an organized condition, when it forms part or the whole of any body having power of increase, or of performing vital actions.

Thus, in the tooth we have first, in the enamel and dentine, an organic body; secondly, in the pulp, a vitalized organization; in the tooth collectively, a vitalized organization, with an organic body as an external covering.

In the preceding sketch the physical arrangements, together with the physiology of the tooth, have been the main objects of attention. The pathology of the organ leads to a consideration of the relative influence of the pulp upon the dentine, and *vice versa*; or to what extent the decay of the one, and the abnormal condition of the other, may be supposed to be able to affect its companion.

The principal physical conditions leading to the decay of the dentine, are—

1st, A defective formation, or an imperfect condition of the enamel covering.

2dly, Mechanical injury to the enamel and the outer stratum of dentine immediately beneath it.

In a former paper on "Lateral Pressure," it was stated that, under certain mechanical conditions of the mouth with regard to its shape, the growing tooth, while within the alveolus, was not subject to pressure from the adjoining organs. That in consequence of this, the enamel would be thickly deposited at its centres of commencement, and not be so spread as to unite sufficiently where the edges of the several plates meet. Now, wherever this want of union occurs we see, especially in the bicusps and molars, either a fine dark line or a pit or fissure, in which decay, sooner or later, is almost certain to occur. And as a strong corroborative proof of the source of this defect, it may be stated, that in mouths of an opposite form, where the alveolar ridge has been under the influence of pressure during the same period, the teeth will invariably be found to be free from such imperfections.

That decay may be produced by mechanical injury is, unfortunately, too well known to admit of a doubt. The effect of undue pressure of one tooth against another, and the friction of a band upon the neck of a tooth, are, unhappily, the too

frequent sources of regret to be unheeded.

The mechanical disintegration of the enamel crystals is the first stage in the proceeding, or, if at the neck of the tooth, a slight breaking up of the surface of the dentine. The absorption of moisture by the injured membrane is the next stage. The development of the acid then follows, and is rapidly succeeded in regular order by the usual symptoms. In the previous paper on lateral pressure, it was stated that decay might be produced through the injury inflicted by one tooth upon another in its passage through the gums. The injury to the one pressed against, as well as the one pressing, is accounted for in supposing that the texture is in some degree bruised or broken up, a slight molecular disturbance in the arrangement of the ultimate particles occurring, so as to lead subsequently to its future decay through being rendered incapable of resisting the absorption of moisture. That this is true, is rendered extremely probable by the fact, that decay under such circumstances extends fully down to, or even beneath, the edge of the gum, while the one causing the mischief almost invariably has a circumscribed cavity on the most prominent face of the enamel, which came in contact with its opponent.

In the case of defective enamel, the course taken is different to this. The first indication of change is the discoloration arising from the organic death of the membrane. To what extent, or whether, if at all, this may be liable to be brought about by the morbid condition of the pulp, must be judged by the ordinary mode of procedure, as it affects the corresponding tissues. That the pulp is liable to inflammatory stasis we can have ocular proof at almost any moment, on the removal of an aching tooth.

Mr. Lister's experiments, recorded in the 'Philosophical Transactions' for 1858, go to determine that whenever inflammatory congestion, or, in other words, that disturbance of the circulation which is truly characteristic of inflammation, exists in any degree, the tissues of the affected part have, to a proportionate extent, a temporary impairment of functional activity or vital energy, and that stagnation of the blood-corpuscles is only a secondary effect, consequent upon some previous change in the tissue and state of the blood; and consequently, it would be unfair to assert of the suspected tissue, that where there are

no red corpuscles there could be no vitiated condition of the fluid part, or no altered state of the membrane, which would lead to their accumulation or "stasis" were they to be present. And therefore, although we have no red corpuscles in the dentinal fibrillæ, it is more than probable that the liquor sanguinis, without them, is present. And that *it*, as well as the tissues for its circulation, are liable to the same change as in ordinary inflammation leads to the inflammatory stasis. Mr. Paget, in his lectures on surgical pathology, says, "When we see such gradual transitions from the normal process of nutrition to the disease of inflammation, that we cannot draw a definition between them, we may be sure that the main laws of physiology are the laws alike of the disease and the healthy process." Therefore, as we have incontestable proof of the presence of nerve-matter in the fibrillæ, and as we know that this nerve-matter requires the presence of a nutritive fluid—indeed, its presence is evidenced in the production of new dentine at the extremities of the dentinal tubes—we are fully justified when we infer that the abnormal condition of the fibrillæ is as near an approach to the character of ordinary inflammation as the nature of the nutritive process itself, as carried on in the dentinal fibrillæ, is to that of ordinary nutrition. But there are here (No. 3 card) two specimens, having in each a very decided patch of red matter, intermediate with the central cavity and the peripheral surface, and no apparent connection with either; which are strongly indicative of the red matter of the corpuscles, if not the corpuscles themselves, as in inflammation of the cornea, having been carried or generated there by inflammation, quite within the substance of the dentine.

In the production of inflammation by the application of external irritants to the skin, these have to act through the outer layers—the epidermis and basement membrane, to get at the tissues of the capillaries; and as the tissues undergo temporary impairment of vital energy, the epidermis being often killed and separated, we have no reason to believe but that the membrane of the tooth should be equally susceptible to the influence of external irritants; and such being the case, the exposure of the peripheral surface of the dentine where the enamel is defective would lead to similar results. That some degree of irritation does result to the dentinal fibrillæ, through imperfections leading to decay, is fully established by the

production of new dentine, the reparative zones of Tomes.

In this, however, we see but the fulfilment of an ordinary law.

One of the common results of inflammation is the production of "inflammatory lymph," which has the characteristic property of "spontaneously" organizing itself, and proceeding by development to the construction of tissues like the natural structures of the body. "In inflammation of bone, the lymph usually ossifies; and the fact is explained by believing that the material formed in the inflammation of each part partakes from the first in the properties of the natural products of that part—in properties which we know often determine the mode of formation independently of any assimilative force." Therefore, if we interpret the facts of the formation of secondary dentine, as it is termed, according to this view, we shall arrive at a somewhat clearer understanding of much that is otherwise confusing and obscure.

There are here (No. 4 card) the crowns of two molars, which have nodules of secondary dentine formed within the pulp-cavity: in one (*C*) the small botryoidal mass remains adherent to the roof of the cavity under its masticating surface; in the other (*B*) it is imbedded in the upper surface of the pulp. In both these, on their masticating surfaces are imperfections in the enamel, with signs of commencing decay. Now, it is a very common circumstance to have one's patients complaining of a degree of uneasiness and uncomfortable feeling, amounting sometimes even to severe pain, in teeth which are not more decayed than these; and I have, on repeated occasions, found such nodules of dentine, sometimes to a large size, implanted in the substance of the pulp, but invariably immediately at the point nearest to the source of irritation. As a layer of new substance attached to the original dentine, we find it of common occurrence, and very often forming a ring or tube, as in *E*, narrowing the canal for the reception of the neck of the pulp. "As a general rule, the less the degree of inflammation, the more is the product like that naturally formed in or by the part, till we descend to the border, at which inflammation merges into an exaggerated normal process of secretion." This is fully borne out in the production of new dentine. When the inflammation is but very slight, we have the reparative zones close to the peripheral surface; but when the production of an acid has commenced, we find the

irritation leading to a more profuse production of matter, and often as unattached globules. It has been supposed that this calcification takes place most readily under an amalgam stopping, and which is possibly true, and owing to the amount of irritation caused; but it is very probable that means may yet be found of bringing it somewhat under control, and thus enable us to effect it with some degree of certainty.

That the pulp, then, is subject to irritation through agents affecting the dentine, or that it can be affected by actions which also tend to the death of the membranous part of the dentine, is fully established by the preceding facts; but to what extent the morbid condition of the pulp from constitutional causes can affect the dentine, it is less easy to define. That the ordinary death of dentine is not produced from internal causes is self-evident from the conical strip of discoloration often, or mostly, *not* reaching to the *centre*. But that a general disturbance of the system may affect the dentine is, I think, implied in the circumstance of the teeth which were previously sound and healthy often becoming rapidly decayed after an attack of fever or some constitutional change. Under such circumstances we find the hair coming off and the skin peeling; therefore there must have been some interference with the cutaneous system generally. And what more likely than that the teeth should have shared in the change? One of the main elements of health in every organ of the system is that of its having its right proportion of moisture. Deficiency or excess leads to disease or disorder. Its supply being mainly through the vessels of nutrition, the extreme permeability of the membranes and walls of the tubes facilitates its ready access to every part of the system; and being preserved constantly in motion while in healthy action, its stagnation is prevented, and every part is kept regularly supplied with its required quota. One of the peculiar features of basement membrane is its ready permeability to fluids; therefore, in the case of deficiency or excess, it is liable to suffer; and thus if at one time there might be a check in the supply, or perhaps even a drain upon it, the abstraction of a portion of its moisture must necessarily affect the condition of the membrane. Hence, when reaction commences, the free return of the moisture, finding the membrane with its vital force weakened, or in a condition to be rendered so by an undue supply, through its mechanical con-

dition having been altered by the collapse consequent upon the check, will tend to the production of its death and the subsequent changes usually attendant upon softened dentine. The principal fact favouring this view is, that the decay occurring under the preceding circumstances almost invariably progresses with great rapidity, and shows a softened state of the dentine to nearly the full extent of the portion remaining. It is often believed that a *soft* state of the dentine indicates a deficiency of the earthy matter. Dr. Stark, on this point, says, "The hardness of bone does not at all depend upon the presence of an unusually large proportion of earthy matter, nor does their increased flexibility and transparency indicate a deficiency of the mineral ingredients; for transparent, readily cut bones of fish contain the same amount of earthy matter in proportion to their gelatinous bases, as do the dense ivory-like leg-bones of deer and sheep. The difference appears to depend upon the molecular arrangement of the ultimate particles, and especially, it seems likely, upon the relative amount of water which the bones contain." Dr. Carpenter says:—"The perfect elaboration of the albuminous constituent of the serum has been shown to be requisite to prevent it from copiously transuding the membranous walls of the vessels which it traverses;" and again, "the transudation of the watery portion of the blood is much increased by any impediment to its flow through the vessels, and also by any cause that produces a diminished resistance in their walls." We have then in the dentine a texture peculiarly adapted to imbibe a considerable amount of moisture, and pathological changes possibly taking place in the pulp capable of furnishing an abundant and abnormal supply of fluid with which it may become "dropsied." Therefore, that the morbid state of the pulp does affect the healthiness and durability of the dentine, I think, may be reasonably believed, and that it may lead to the death and rapidly developed acid tending to the speedy destruction of the whole crown of the tooth.

In the early stage of decay when stopping is about to be had recourse to, the removal of the dead dentine is but fulfilling the end the pulp would do for itself, had it the power of absorption and exfoliation. As it is, instead of removing the dead part, it attempts a new barrier between itself and the encumbrance; and were it *not* possible for acidity to supervene, there is every

reason to suppose such an attempt would prove successful. These stoppings in incipient decay are notoriously the most lasting. The reason *why* they should be so is obvious; the removal of the *dead* membrane, and its place occupied by a *non-absorbent, non-decaying* substance, is all that is needed to secure success. But when acidity has once commenced, the neutralization of the acid in the remaining portion of the dentine is essential. This, however, is rarely or never done. Indeed, I believe it has never before been suspected that the prepared cavity in most cases still bears strong traces of an acid. That it does so is proved by the rapid action upon a metallic paste stopping. Most of the metallic oxides are soluble in lactic acid, and photography has taught us that many of these are darkened by the action of light, &c. Therefore, neutralizing the acidity in the cavity prior to the use of an amalgam *ought* to prevent its becoming discoloured. This I have long since proved to be the fact, and that with *proper care* the mercurial stoppings or amalgams may be used even to the front teeth, as well as in those of delicate texture, without the slightest trace of discoloration. After clearing the cavity of so much of the softened dentine as may be needful, a small portion of a paste composed of chalk and magnesia is placed in the cavity, with as much moisture as will suffice to form a creamy consistence. The cavity, is then filled lightly with lint, and this is suffered to remain until the stopping material is ready. Of course, the state of the tooth must regulate the length of time necessary to effect its completion, but in ordinary cases five or ten minutes will be sufficient. The cavity must be well syringed out with hot water several times previous to being dried finally for the stopping. Under any circumstances, I almost invariably have recourse to an alkali previous to plugging, and I rarely or never find discoloration follow when this has been carefully attended to.

In the preceding remarks the various physical, physiological, and pathological facts, where practicable, have been given in the words of the several authors referred to, and where otherwise with a full acknowledgement of their source; thus leaving myself responsible only for the deductions which have been made from them.

What I have sought to establish is this: That the human teeth are *not* merely *dermal appendages*, but a portion of the cutaneous system, all parts being so modi-

fied as to be peculiarly adapted to the altered circumstances in which they are placed and the special duty required of them.

That *decay* is the natural death of the organic basis, or basement membrane, of the dentine, and consequently a *vital phenomenon*. And that, subsequently, the presence of moisture in the dead membrane leads to the development of *lactic acid*, which is the cause of its progressive tendency, and that a more correct definition, instead of the term "*caries*," will be "*vital decay*" so long as it retains its primary character, and "*chemical destruction*" when acidification has commenced.

That artificial dentures of organic materials are subject to the same laws, and owe their destruction to precisely the same cause as do teeth in their sockets.

That the epithelial cells, from the membrane of the gums, &c., also lead to the development of lactic acid, and are the cause of that destruction of the enamel so often met with in the upper front teeth. And that the formation of new dentine, or "*calcification*," as it is termed, is the result of the common law by which inflammatory lymph leads to the production of new tissue, and is consequent upon irritation caused by external agents acting upon the pulp and its dentinal fibrils. And to point out that the proper neutralization of the acid remaining in a decayed tooth, *prior to filling*, will not only render the stopping far more likely to prove successful, but will wholly prevent the dark stain hitherto considered one of the unavoidable accompaniments of amalgams, and thus render this class of stoppings infinitely more valuable to the profession.

The PRESIDENT.—I fear, gentlemen, the time is so far gone that it will leave us very little opportunity of discussing this most important matter. I am satisfied all present must be delighted with the manner in which Mr. Bridgman has treated a subject which has caused so much controversy among learned physiologists of the present and past time. I am only sorry we are in this dilemma, that it would be utterly impossible to enter into this matter well, or satisfactorily, in half an hour (the only time we have the power of taking). If the discussion can be carried on at the next meeting, I am quite sure there will be many who will be very happy to give their opinions. May I call on some gentleman

to commence the discussion on this very elaborate and learned paper?

Mr. TOMES.—Sir, the author of the paper has alluded to so many subjects, and has entered upon so many points of interest, and traced their relations so carefully, that it is impossible, almost, to enter upon a discussion of the subject until an opportunity of reading the paper is afforded. I paid as much attention as I could, and I confess that I am not now in a position to discuss the various points, connected as they are one with another, that have formed the substance of Mr. Bridgman's paper. Other members of the Society may have followed the paper more closely, or may be more fortunate in possessing a larger knowledge of the various questions brought to bear upon the subject of this paper. I do not know what may be the feeling of the Society, but in my own opinion it would be better, for the sake of doing justice to Mr. Bridgman's paper, that we should adjourn our discussion until the next meeting of the Society. (Cheers.)

Mr. UNDERWOOD.—I fully agree with the remarks that have fallen from Mr. Tomes, and with his suggestion that the discussion on this paper should be adjourned. I think, from the applause which followed Mr. Tomes' remarks, that the members of the Society will agree with us. I beg to second the proposal, "That the discussion of this paper be adjourned, in order that the Society may be better able to do justice to it."

The PRESIDENT.—It has been proposed by Mr. Tomes, and seconded by Mr. Underwood; "That this discussion be adjourned, in order that the Society may be in a better position of doing justice to it." Is it your pleasure, gentlemen, that it be adjourned?

The adjournment was unanimously agreed to.

The PRESIDENT.—It remains for me to return our best thanks to Mr. Bridgman for his able paper, and I can only hope that at the ensuing meeting he may be here to defend himself, for probably his views may differ from those of many gentlemen who are here this evening.

The Society was then adjourned.

On the table were specimens illustrative of some of the theories propounded by Mr. Bridgman, and presented by him to the museum. Also a model and portion of superior maxilla from which it was taken, illustrative of the effects of

filling the anterior molar of upper jaw with amalgam presented by Mr. Drew, and a large copy of Owen's 'Odontography,' presented by the President, Mr. Bigg.

DINNER OF THE LICENTIATES IN DENTAL SURGERY.

ON Wednesday, the 18th instant, about sixty gentlemen dined at the Albion Tavern, Aldersgate Street, to celebrate the first anniversary of the establishment of the degree of Licentiate in Dental Surgery.

The chair was occupied by Arnold Rogers, Esq., who was supported by W. A. Harrison, Esq., and S. Cartwright, Junr., Esq., as vice-chairmen. After the dinner (which was well served) the usual loyal and patriotic toasts were given, and received with much spirit. The CHAIRMAN then gave the toast of the evening—"The new Degree of Licentiate in Dental Surgery, and may it realise all the anticipations of its promoters." In proposing this toast, Mr. ROGERS gave a *résumé* of the difficulties which lay in the way of those gentlemen who for a long time past (going back to a period extending over nearly twenty years) had desired to secure for the dental surgeon a legal mark of recognition as a professional man—and one, moreover, which would be accepted by kindred professions, and by the public. The worthy chairman traced, in a concise and remarkably clear manner, the course taken by the promoters of this new degree, which he was happy to say had at length resulted in such complete success—observing, that the elevation of the profession now depended upon the manner in which the thoroughly qualified dental surgeon would uphold and maintain its dignity, that the power to accomplish this object was, in fact, now in their own hands, and that to their conduct the eyes of all would be directed for the future. He concluded by saying, that he sincerely trusted that the gentlemen holding this degree would make a point of meeting on the 18th of March, in every year, *for ever*, and celebrate in a like pleasant manner the anniversaries of this auspicious event—and that he hoped he might be spared to meet them all again in March, 1862. The toast, which was most enthusiastically received, was drunk amid continuous rounds of applause.

The next toast from the chair was—"The

Royal College of Surgeons of England," which was very warmly received. Mr. HARRISON gracefully responded on behalf of the College, and in the course of his remarks congratulated the meeting on the fact that their profession had at length been legally recognised as a branch of surgery—stating that, although he held three diplomas from the College of Surgeons, there was not one which he looked upon with more gratification and pride than that, the establishment of which they had that day met to celebrate—inasmuch as it was the diploma which testified to his fitness to practise the department of the profession which he had for many years past exclusively followed. (Cheers.)

Mr. UNDERWOOD then proposed—"The Board of Examiners of the Royal College of Surgeons of England," and commented upon the known and appreciated excellencies, talents, and attainments of the gentlemen who composed the Dental portion of that board—adding, that he considered the appointment by the College of the eminent gentlemen who directed the examination in anatomy and surgery at that board as a proof of the high estimation with which its council regarded the new degree. (Applause.)

The toast, which was enthusiastically received, was responded to by Mr. TOMES, who, on rising, was greeted with long-continued applause. He congratulated the licentiates on the establishment of the new diploma, and testified to the sincere desire of the board of examiners to make it worthy of the ambition of the profession—dwelling particularly on the point that the promoters of this degree had done all that they could do, in getting it established and legally recognised, and that the position which the profession might henceforth take rested with its own members. (Cheers.)

"The Odontological Society of London" was next given by Mr. ROBERTS, of Edinburgh, as the source from which the idea had originated, and the body by which the plan had been worked out, which had led to the establishment of this degree. This was acknowledged by Mr. BIGG, the President for the year, who expressed his hope that the time was not far distant when there would be unanimity of feeling in the profession on this point.

Mr. CARTWRIGHT then proposed the health of "The Chairman," and referred to the many estimable qualities of that gentleman, who had ever proved himself the

warm and liberal supporter of everything having for its aim the welfare of the profession, and the advancement of its members. The toast was most cordially received, and was acknowledged by Mr. ROGERS in a very feeling manner.

The following toasts were also given:—"The Licentiates present from Scotland, Ireland, and the Provinces" (proposed by Mr. SERCOMBE, and responded to by Mr. REID, of Edinburgh); "The absent Licentiates;" "The Vice-chairmen and Stewards;" and "The Ladies." We noticed in the room gentlemen from Scotland, Ireland, and distant provincial towns—who thus testified their zeal in the cause, and their high appreciation of the efforts of the promoters of this gathering to secure cordiality and good feeling amongst the licentiates as a body—and it was announced that letters had been received from forty or fifty absent licentiates, expressing their approbation of the meeting, and their regret that distance, and other causes, would prevent their presence at it. We regret that want of space prevents us from giving a more detailed account of this most interesting meeting, but may add that it was enlivened by songs and music by Mr. Ransford, Miss Ransford, and Mr. Ransford, Jun., and that this celebration of the first anniversary of this important event in the history of the dental profession passed off to the entire satisfaction of all present, and with every promise of future good.

BOOKS RECEIVED.

- 'The Dental Register,' February, 1861.
- 'The Dental Cosmos,' February, 1861.
- 'The Chemist and Druggist,' February and March, 1861.
- 'Southampton Times, and Winchester, Portsmouth, Isle of Wight, and Hampshire Express.'

To Correspondents.

NOTICE.

Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.

Communications have been received from Messrs. S. L. Rymer; T. Drew; — Tennison; Bridgeman, of Norwich; J. N. Hearder; Spes; James Firth (declined with thanks); C. A. Rodway; and Alfred Hill,

British Journal of Dental Science.

No. 58.

LONDON, APRIL, 1861.

VOL. IV.

Dental Surgery and Medicine.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

(From '*The Dental Cosmos*,' October, 1860.)

(Continued from page 58.)

Temperaments.—I think, other things being equal, that a prognosis of dental conditions may be much assisted by taking into consideration the temperaments. A person in a state of equilibrium, so far as all his organs are concerned, may be pronounced temperamentless, and should be in the most perfect health. It follows, then, that the marked possession of temperament—by which we mean a predominance either of function or development in any structure, organ, or system of the body—is apt to lead to disease of that part, and, *per se*, of its relations. Thus, in the lymphatic, which is characterised by excess of colourless tissue and deficiency of red blood, we have the predisposition to scrofulous conditions. The nervous temperament afflicts our patients with neuralgia; the bilious gives us the dyspeptic conditions. Of course, I need not proceed to draw other inferences than those a few moments since alluded to. So far as the cure is concerned, it is to be found in any means that will tend to the restoration or production of the equilibrium. The lymphatic man should have bracing air and plenty of exercise, and such medication as would tend to put more iron and oxygen in his blood; the nervous man should quit his books and sedentary life; the bilious should leave his warm or malarious district, and seek health in careful diet and the bracing air of a colder atmosphere.

There is a constitutional condition of

the breath that has great influence on the health of the teeth, that is, so far as the ability to make good operations are concerned—a condition to which I believe I was the first to call attention. It consists in its being laden with an excess of moisture so peculiar in character as to destroy all the cohesive qualities of our gold, and, however careful we may be in arranging our napkins, this ethereal vapour will insinuate itself and defeat our purpose. In the interesting paper on "Buccal Secretions," read at Washington, by Dr. Taft, occurs the following passage:

"There is another depraved condition of the saliva, not so marked in its character nor injurious in its effects as that just referred to. It is characterised by a semi-oily condition; it is free from that tenacity and stringiness exhibited by some other depraved conditions. It insinuates itself into every interstice where it can at all approach; it will moisten the surfaces of the teeth when the utmost care is taken to protect them; and the dentist will thus often find himself exceedingly annoyed by saliva of this character. Where it exists, it is almost impossible to keep an operation dry. The peculiarity is derived from the mucus, which, in such instances, is elaborated very freely."

With all due regard to the views of Dr. Taft, I think he will find he has the wrong vehicle for this oily peculiarity. It cannot be the saliva, because, by the careful employment of napkins, we can protect our cavity, particularly simple upper ones, which give us the same trouble as any others. And as to its being a mucoid secretion, I am also disposed here to doubt his conclusion, because by the use of

powerful astringents, such as a strong solution of iodine painted over the mucous membrane just before operating, we can equally protect ourselves against the secretion of mucus, and which, from oft-repeated experiments, I know to be useless. That it is in the breath, I infer from its ability to moisten quickly and thoroughly any substance held before the mouth, and because the best guard I have been able to find against it is to have my patient breathe through the nostrils during the time of the operation. As regards a treatment, I have not as yet had an experience which would make any suggestion of much value. I can only remind you that it is specially a condition of the lymphatic, strumous temperament, and any treatment must of course incline to that direction.

Before taking my seat, I desire to direct attention to a diathesis which a somewhat close observation has led me to infer has much ill effect on the teeth; I allude to the uric-acid diathesis. In this diathesis the teeth will be found quite prone to decay, while uric acid is discoverable in the fluids of the mouth—I mean uric-acid crystals. It is very true that these crystals are soluble in fluids found in the mouth coexistent with them; but the decay of the teeth must be in some way associated with the diathesis, for my investigations have led me to infer that the uric acid found in the mouth can have nothing to do with it. I merely throw out the suggestion, that others, better able than myself to pursue such chemical investigations, may examine the subject, if deemed of sufficient importance.

If I were asked to name a disease or condition which destroyed most teeth, I would answer, unhesitatingly, "anæmia." In the anæmic patient there is not a part of the body that would not succumb as readily as the teeth, all conditions being equal. Of the ill effects on the teeth of this morbid poverty of the blood we have the most marked evidence in the chlorosis of the young girl. Without a union of the general with the local dental treatment, operations do not seem of much effect. The teeth decay rapidly, and the best operations are made comparatively useless by the caries almost at once re-appearing. Yet, important as is the influence of this condition on the general health, it is happily one of the best understood; and were it not for the complications which its continued existence

begets, its treatment might be summed up in the directions: iron, good food, and exercise in the open air. And when in this uncomplicated condition, why should it not be the duty of the dentist to treat it? It costs him no trouble; and even if it did, such cases have sufficient interest to repay him. When, however, complications exist which involve important parts and functions, as, for instance, organic diseases of the heart, liver, stomach, or intestines, it may perhaps become questionable, as a matter of policy and convenience, whether the physician should not share the case with us; but I opine it never can be a question whether or not the dentist should or should not be familiar with them.

Dr. McQuillen remarked that he had ever advocated the most extended curriculum of study on the part of dental practitioners and students; but had also been disposed at the same time to observe, so far as he was individually concerned, a line of demarcation between the practice of dentistry and medicine. In the observance of this, he had possibly been disposed to accord more to the practitioner of medicine than he would actually claim, or there was any occasion on the part of the dentist to yield.

With regard to the subject under consideration, it is a matter alike interesting and important, both to the medical and dental practitioner. The first may be compelled, in his efforts to arrest the progress of disease, to employ agents which exert a deleterious and destructive influence upon the teeth, while the latter is called upon not only to observe these effects, but in addition, if the teeth are not too radically affected, to exercise his handiwork in remedying the ravages attending upon the use of such agents. He did not wish to be understood by these remarks as reflecting upon the medical practitioner for using such agents, as he fully recognised that where it is a matter of life or death, or where there is a choice between recovery and long continuance of some chronic affection, it is a matter of vital importance that the most potent and reliable agent should be administered, however destructive it may prove to the dental organs. But, when such agents are employed, it must be evident to all that every precaution should be exercised to prevent or neutralize their action upon the teeth. Thus it is an important and should be an ever-recognised indication, on

the part of the medical practitioner when prescribing an acid remedy, to accompany it with a prescription for the alkali best calculated to neutralize the portion which remains in the mouth. It is to be supposed that such a course would naturally suggest itself to the mind of every physician, and yet he had been informed by an intelligent druggist that such a thing rarely, if ever, occurs. Advice may be given, but it is in that general manner which rarely, if ever, commands implicit obedience on the part of the patient.

Of the different remedies employed by medical practitioners, one of the most common is the tincture of the chloride of iron. Now, valuable as this agent is, when properly employed, the indiscriminate and careless manner in which it is used by some is highly censurable. He had been informed by the gentleman already referred to, that the wholesale order for this article from country practitioners far exceeds the average of the orders for other articles.

In illustration of the effects of this remedy upon the teeth, he exhibited three teeth which had been exposed to the action of the official preparation for twenty-four hours; on examination, the enamel of the teeth was found considerably softened.

Reference was then made to the indiscriminate manner in which the different mercurial preparations had been employed in former times, and the unfortunate sequences which followed their use, viz., the loosening and falling out of teeth, accompanied, in many instances, by the extensive exfoliations of bone. Fortunately, such results are but rarely presented in our day. For instance, those horrible deformities of the face accompanying the syphilitic disease so common in other days, are rarely presented in ours; and this is no doubt due to the fact that mercury is not employed to the same extent or in the careless manner which formerly characterised its use. As had been truly said, "mercury is a two-edged sword, capable of doing a great deal of good or a great deal of harm, according as it is properly or improperly employed."

Dr. Fitch thought the importance of this subject had not been fully appreciated by the dental practitioner. Medicinal agents must act upon the teeth, if at all, either constitutionally or chemically; and in our investigations we must necessarily trespass upon the hitherto acknow-

ledged domain of the medical practitioner.

That important influences are exerted upon the teeth by the constant changes superinduced in the organism by the administration of different medicinal agents, cannot be a question of doubt; and although the teeth, of all the human organs, are the lowest in the scale of vitality, we must yet recognise the two forces of organic life, viz., vital and chemical, as presiding over them. If this be a true position, it follows naturally that these forces, in their harmonious or disturbed action, must be ever active as in other organs, yet in a degree corresponding to the grade of their vitality, to preserve the integrity of organic power in repelling and resisting disease, or to render their structure an easy prey to constitutional, chemical, or mechanical influences.

The two last-named conditions may be overcome to a certain extent by local treatment, but the former will require a restoration to harmony of the organic forces which control and direct nutrition, disintegration, &c., influences which properly constitute the tissue a living structure. To restore this harmony of the chemico-vital force, viewed either in a general or specific sense, requires general or constitutional treatment; but that there is great danger of producing this functional disturbance by an exhibition of medicinal agents, whenever given, either in doses too large or too long continued, is a position which cannot be successfully controverted.

If this may occur, and it no doubt often does, why should not the dentist, in diagnosing and treating diseases of the teeth, not only extend investigation in this direction, but meet the demands in the individual instances by a thorough and persevering constitutional treatment? Indeed, is it not his duty and special province? Neither ought this to be considered a trespass upon the domain of the general practitioner of medicine.

He thought the dentist should be so educated as to readily diagnose, from the temperament and constitutional conditions of his patient, the causes operating in the destruction of the teeth; hence the importance and necessity of a thorough knowledge of those subjects embraced in this view of the question. Could refer to an instance occurring in early practice: temperament, bilio-nervo-lymphatic, with a predisposition to strumous habit; teeth

finely developed; organic substances in excess. He filled the superior incisor teeth, but they, unfortunately, dropped out in two years; refilled with great care, and with like success in about the same length of time; again operated, and at the third visit, which occurred within two years, found the teeth broken off near their alveolus; has since considered this a fit subject for constitutional treatment.

He thought physicians in some instances very careless, and frequently reprehensible, in the administration of remedies having a chemical affinity for the different constituents of the teeth, manifesting an utter disregard as to the importance and value of protecting these organs.

Had been much interested in the specimens of natural teeth presented that had been subjected to acid tests by Drs. Barker and M'Quillen. Some years since had seen some marked instances of natural teeth subjected to chemical tests in a course of experiments conducted by Dr. Wescott, of Syracuse, and more recently by Dr. Allport, of Chicago. While the action of many of the remedial agents upon the teeth was rapid and marked, with others it was slow, and with a few, except in discoloration, was scarcely perceptible.

Dr. BARKER remarked, that while he would agree that in some sections of the country the use of calomel, or hydrargyri chloridum, was not used as indiscriminately as in former days, yet was induced to believe, from a knowledge of the general prescriptions of many medical practitioners in other parts, that it was still used in too large doses and with too little care. He could not believe that the injurious effects upon the teeth and alveolus, observable after prolonged ptyalism, were due to subsequent neglect; but considered the blackened appearance of such teeth and their early decay to proceed from a loss of circulation derived from the periosteum, which, if the ptyalism is prolonged, usually dies, and in many cases death of the dental pulp likewise occurs. He had at present under treatment the inferior incisor and canine teeth of a lady, who, a few years since, was profusely salivated. After her recovery, the teeth became firmly fixed in their alveoli; but absorption of the alveolar process, surrounding the teeth above mentioned, has proceeded for the last year to such an extent as almost to expose the extremities

of their fangs. The pulps of each have died, and caries has attacked the labial surfaces. In a late conversation with a Russian, whose business was fire-gilding, in which the fumes of mercury are, to some extent, necessarily inhaled by the operatives, was assured that even when the effect upon the systems of the workmen had subsided and the teeth had become firmly fixed in their sockets, in a few years absorption of the alveolar process would commence, and the teeth would gradually fall out of their sockets.

He would briefly refer to phosphoric necrosis, which is fortunately rare, and is usually met with in those persons employed in match factories, and has been by the best writers attributed to the result of uncleanness on the part of such operatives; it being considered that the poison, in the form of a volatile acid of phosphorus, such as the phosphoric acid, is taken into the mouth with the food, is absorbed by the saliva, for which it has a strong affinity, and that thus the bony structure is directly attacked. If any of the teeth are carious and the alveolus is exposed, the local malady commences and extends slowly and insidiously along the maxillary structure. The effect upon the bone is most probably chemical, phosphorus having an affinity for the earthy constituents. Richardson supposes that some new combination is set up between the phosphorus, to which the bone is unduly exposed, and the other chemical elements, and that upon this combination the disease is based. The disease, unfortunately, in almost all cases, terminates fatally, though some, I am told, have been successfully treated at the Pennsylvania Hospital.

He considered a most frequent cause of caries in this country was dyspepsia. In that disease we not only have a general derangement of the functions of digestion, but acid eructations from the stomach; and the salivary glands, instead of eliminating an alkaline fluid, throw out an acid one; the mucous secretions also present the same acidity. If, during such a condition of the system, acids are taken, either in food or as remedial agents, is it not just to conclude that chemical action and subsequent decay would be the result?

He remarked that a difference of sentiment existed with regard to the effect of sugar upon the teeth—many considering its influence under all circumstances as deleterious. He was, however, inclined

to believe it was perfectly harmless, when the salivary secretions were in a normally alkaline condition. If, however, the saliva should be acid, and portions of sugar should be retained between the teeth, acetic acid would be formed, which would affect the teeth most injuriously, and would not, as in a healthy condition of the secretion, be neutralized by the presence of normal saliva. He considered that such quantities of saccharineous articles of diet could be taken and retained in the mouth as to effect and change even healthy saliva, and in such cases act upon the teeth. He was instituting several experiments to determine the effect of certain kinds of food upon the teeth, but was not at present prepared to present them.

Dr. GARRETTSON was inclined to think his friend wrong in his opinion as to the decreasing exhibition of mercury. In venereal disease, it is certainly not his experience. It is most true, that there is a great decrease in the number of cases of ptyalism, but this is owing to a judgment and caution in the administration of the medicine. The bichloride, which is the preparation now principally employed, may be given for a very long time without inducing any perceptible salivation. This preparation may be employed in minute doses, one twelfth of a grain being the quantity mostly given. Dr. Gross is in the habit of prescribing it in syphilitic conditions, in the proportion of one twentieth of a grain to ten grains of the iodide of potassium, three times a day. Mercury thus prescribed, if carefully watched, may be given almost continuously for weeks and months. Has known a man salivated with ten grains of the single chloride or calomel, so that the tongue could not be retained in the mouth, and this effect was produced in a single night. Ten grains of calomel is quite a common dose. Mercury is the sheet-anchor now, as ever, in syphilis; and there are few, if any surgeons, who would run the risk of taking charge of a case without its use. But mercury is not a cause of dental caries. It certainly does destroy the teeth; but its effects are produced by destroying the vitality through the periosteum. Mercury acts upon the gums; it affects the periosteum in proportion as it affects the gums. The teeth will drop out, if ptyalism is severe, completely denuded of their periosteum.

(To be continued.)

CEREBRAL SYMPTOMS INDEPENDENT OF CEREBRAL DISEASE, CAUSED BY SECOND DENTITIONS.

From a Lecture delivered at the Hospital for Sick Children. By CHARLES WEST, M.D.

(From the 'Medical Times and Gazette,' April 6th.)

WE are all so familiar with the occurrence of convulsions during the first dentition, that in infancy the risk is rather of the grave disease to which they are possibly due being overlooked, than of the influence of teething in their production being under-rated. On the other hand, the occasional share of the second dentition in exciting epileptic or other convulsive seizures is too little borne in mind; and a graver prognosis than the event justifies is sometimes expressed in consequence.

In a little work on dentition,* published some years ago by my friend and former colleague, Dr. Ashburner, there are many cases related illustrative of this fact. Of these, I will select the following:

"A boy, twelve years of age, was cutting the second or posterior permanent molars of the upper jaw before those of the lower, and the process was accompanied by twitchings of various parts of the body. At last he became affected with chorea. Being a very nervous lad, if any notice were taken of him, he would quite involuntarily make the most extraordinary faces, and contort his body into various attitudes that appeared to be most difficult and painful. This chorea continued for three months, during which time a variety of medicines were swallowed. At last he fell into an epileptic fit, struggling much, foaming at the mouth, and grinding the teeth. I thrust my forefinger along the inside of his cheek, and found a hard, cartilaginous space on each side, behind his first molar tooth. I succeeded in gashing these parts. He uttered a scream and fell out of his fit, becoming quite sensible, nor had he a recurrence of his chorea."

So sudden and complete a cessation of symptoms on the removal of the mechanical irritation produced by the pressure of a tooth is decidedly an unusual occurrence. In by far the greater number of instances, the symptoms of disorder in the nervous system do not admit of being cut short thus suddenly and decisively; they depend not simply on the local irritation

* 'On Dentition,' &c., 12mo, London, pp. 97.

produced by one particular tooth, but, like the headaches which I spoke of at the commencement of this lecture, they are the result of the disturbance of the nervous system, to which the whole process of development has given rise, just as, in later life, the hysteria of the young woman is connected with the imperfect accomplishment of the sexual function, and is not removed by a single occurrence of menstruation.

To this class of cases may be referred the history of a boy between eleven and twelve years old, whom I saw some years ago. While, apparently, in good health he was attacked by a fit one morning, in which his head was drawn to the right side. His face was distorted, especially its right side, and his right arm was in much more violent movement than his left. This fit was not preceded nor followed by sleepiness or headache, nor was it attended by any loss of consciousness, and the same characters were observed in all his subsequent seizures except one, which—the third in order of occurrence—was followed by temporary delirium for five or ten minutes. With the exception of the first and third of these attacks, all the others ceased in a minute, and the instant the spasmodic movements subsided the boy resumed his former occupation, as if nothing had happened. Only once did more than one seizure take place in the course of twenty-four hours; but the intervals between two attacks were very irregular; sometimes eight days had passed without an attack, while, at other times, they recurred daily for three days; and, altogether, between the beginning of July and the end of December, more than fifty occurred, with no alteration of their character or increase in their severity, while neither the boy's health nor his intellect appeared to have suffered in any respect from the affection. One point observed with reference to them—which, I may add, is often noticed in cases of epilepsy—was, that they almost invariably happened soon after rising in the morning, generally between the hours of seven and nine o'clock.

At first, he was actively purged, but with no effect; he then took the valerianate of zinc, likewise fruitlessly; and then, as he was cutting the second molar tooth in the right side of the upper jaw, and as there was much tenderness of the gum over it, the gum was freely lanced, and all treatment was suspended. No amendment followed this measure, and the boy was, there-

fore, put for a time on the nitrate of silver, but with no results.

The idea which had been entertained of the possible connexion of the attacks with the process of dentition appeared to me still to be the most probable, and for the following reasons:—That, in spite of the continuance of the attacks, there had been no such deterioration in the boy's condition as might have been expected if they had been dependent on cerebral disease; that no impairment of powers over the affected side had followed the attacks, while such an occurrence would have inevitably occurred if the attacks had been dependent on tumour or tubercle in the brain; that headache was completely absent, and all the general functions were perfectly well performed; while, further, the anomalous character of the attacks themselves seemed still further to point to some eccentric source of irritation.

On looking into the boy's mouth, the teeth in the upper jaw were observed to be very crowded and over-lapping each other; the first molar on the left side was decayed, the second molar was still beneath the gum. I advised the extraction of the decayed tooth, and lancing the gum over the second molar, while all medical treatment besides should be discontinued. Before these measures were adopted, the boy had six consecutive attacks in the course of one day; two of them being very severe, and attended, like ordinary epilepsy, with loss of consciousness. The extraction of the decayed tooth was followed by immediate diminution in the convulsive attacks, both in point of frequency and severity, and the improvement lasted for nearly two months. The second molar tooth was then partly through the gum, when a succession of seizures, some of them accompanied with loss of consciousness, once more took place. Free lancing of the gum was succeeded, as before, by immediate improvement, and not only so, but the tooth being now quite through the gum, all spasmodic movements of the arm ceased, and occasional slight twitchings of the face were the only relics of symptoms which had seemed so formidable.

One caution, which this case suggests, I cannot forbear to offer, although it is not immediately connected with the subject of this lecture. It relates to the possibility of attacks of this nature, and still more of those of a more decidedly epileptic character, becoming permanent as the mere result of frequent recurrence, and this quite inde-

pendently of the existence of any organic mischief in the brain. Thus, I have seen instances in which the convulsions that originated in whooping-cough, have outlasted the disease that occasioned them, and the fits, which at first were due to some error in diet, reproduced again and again by similar, though perhaps smaller, indiscre-

tions in the same respects, until they become at length habitual. Each fit, too, leaves the child more predisposed to its recurrence, and from slighter and still slighter causes; so that never is the old Latin adage, *Obsta principiis*, more important than in the case of the convulsive diseases of early life.

Mechanical Dentistry.

ARTIFICIAL TEETH.

(From 'The Lancet,' March 23d, 1861.)

To the Editor of the 'Lancet.'

SIR,—Coralline (coloured vulcanized India rubber) being now extensively employed as the basis of artificial teeth, it requires to be satisfactorily determined whether the subsulphate of mercury used for the colouring is likely in any case to produce prejudicial effects. The material being very hard and insoluble, and not capable of being much softened even in boiling water (the dentists employ steam of 230°), there seems no danger from the vermilion pigment; yet, as the extent of surface in a full set of teeth is twelve or fourteen or more square inches, and the material at the temperature of the human body is acted upon day and night without ceasing by the saliva, and the gums and tissues which come in contact with it are peculiarly susceptible of mercurial influence, it may not be quite certain, without the test of experience, that no evil can arise in the case of a morbidly sensitive invalid. If any such cases had been known to occur, the dental profession would assuredly have changed the cinnabar for some other pigment. But the use of the material is recent, and it would be well to watch the testimony of facts as to whether any of the symptoms of mercury (not amounting to salivation or other marked phenomenon) can be suspected in the mouth or pharynx or alimentary canal.

I am, sir,

Your obedient servant,
A DENTIST.

March, 1861.

We do not know the composition of the numerous substances advertised as "Coral-line Vulcanized India rubber for flexible gums," &c. &c. &c.; any or all of which may, for aught we know to the contrary, and as the writer of the above letter suggests, contain subsulphate of mercury, and may therefore be most prejudicial to the wearer of artificial teeth made with them, even although such wearer should not be "a morbidly sensitive invalid." The subsulphate of mercury is a potent salt, far more potent than calomel, producing nausea, vomiting, ptyalism, &c.; the maximum does not exceed one grain. Under these circumstances we should not like to be responsible for the consequences of its use as a colouring agent in the India-rubber bases of artificial teeth; nor do we, taking its colour into account, clearly understand the object of its employment in that way. With respect to the "vermilion pigment," the only colouring matter used as yet by the better class of dentists, "A Dentist" need not, we think, be under the least uneasiness; its perfect inertness, when pure, is, we believe, beyond all doubt. On this head we would recommend the writer to read the remarks of Mr. Owen at pp. 470 and 484, Vol. II, of this Journal.—ED. 'B. J. D. S.'

Chemical Department.

PRACTICAL HINTS ON ELECTRICITY IN RELATION TO ELECTRO-PHY- SIOLOGICAL APPARATUS. By J. N. HEARDER, Electrician, Plymouth.

(Continued from page 60.)

ON EXTRA AND SECONDARY CURRENTS AND MAGNETIC REACTION.

It has been a long-disputed question whether, in the development of magnetism by electricity, the latter does not change its character and become converted into the former; but the most probable hypothesis is that they are only correlative forces, and are not mutually convertible into each other.

The phenomena of action and reaction observed between these two forces seem to establish their separate identity. It was discovered by Faraday that when a voltaic current traversed a wire, it gave rise to another electrical current in the same wire in an opposite direction; and that when the battery current was suspended, another current again took place in the wire in the same direction as the battery current. The first of these has been called the extra current, and the second the secondary current. Hence it has been generally supposed that voltaic currents originate other sympathetic currents by induction. A little reflection, however, will show that these effects do not arise from the inductive action of electrical currents simply considered as such, but from the reaction of the magnetism which these currents are capable of developing; indeed, it is the author's firm opinion that the extra and secondary currents are purely magneto-electric currents, and have very little to do with the primary voltaic current, except so far as it shall be capable of exciting magnetic action.

Although it may be difficult to comprehend how two electrical currents can circulate in opposite directions in the same wire, and at the same time, yet experiments show this to be the case, and, if it did not, *a priori* reasoning would infer that it ought to be so.

If a voltaic current can excite magnet-

ism, it would be legitimate to infer that magnetism would react and excite electricity, and this is found to be the case; and again, if a current of voltaic electricity in a given direction excite a certain polar state of magnetism, it might reasonably be expected that if the reaction of this magnetism originated an electric current at all, it would be in the reverse direction of that which produced the magnetism, and this is just what takes place.

Let then the ends of a conducting wire, coiled into the form of a helix or spiral, be connected with the poles of a voltaic battery. At the instant of contact the current flows through the wire and excites magnetism, and at the same instant an electric current is developed in an opposite direction in the same wire, but with this difference, viz. that the voltaic current and its correlative magnetism are permanent as long as contact is maintained, whereas the extra reverse current is only instantaneous and lasts merely whilst the change in the wire from the normal to the magnetic state takes place.

If contact with the battery be now broken the current is suddenly suspended, and the wire as suddenly loses its magnetism and returns to the normal state. During this change another transient current or wave takes place, and, as might be expected, in the direction the reverse of the first.

Now since the first current was in opposition to that of the battery, it follows that the second must be coincident with it.

The existence of the first induced current is not so easily shown, because both the voltaic and extra current are circulating in a closed circuit; but when the circuit is broken and the battery current ceases, the secondary induced current has to traverse an interrupted circuit, and it is here that the peculiar characteristic which distinguishes it from the primary or voltaic current is manifested, viz. its static intensity. This intensity is such as to enable it to overleap the interval caused by the interruption of the circuit, and thus produce the bright spark which is observed whenever a voltaic wire is sepa-

rated from conducting contact with the battery. Whatever be the force of this secondary current in the conducting wire alone, it is enormously increased when the coil or helix is made to surround a soft iron core, since this serves to take up, concentrate, and more effectually radiate the magnetic influence of the wire; and the author has found that the secondary current is infinitely more dependent upon the amount of this concentrated magnetism than upon the character of the primary current; indeed, he considers it to be wholly dependent upon magnetic changes, no matter how produced.

(To be continued.)

ETHER v. CHLOROFORM.

(From 'The Lancet,' April 13th, 1861.)

It is unfortunately too well known that with the many advantages belonging to the administration of *chloroform* as an anæsthetic is linked the possibility of an occasional fatal result, even in the most careful and experienced hands. There are very many who maintain that this drawback does not attach to *ether*. They assert its entire immunity from danger, although there may be some persons to whom the odour of it is offensive and irritating. It is less portable and agreeable to inhale than chloroform, but not more exciting or less efficient. Dr. George Hayward (the first surgeon who performed a capital operation upon a patient rendered insensible by the inhalation of sulphuric ether), during a recent visit to Europe, instituted inquiries upon the point in question. Before his return across the Atlantic he published some 'Remarks on Anæsthesia and the Agents employed to produce it,' in which he says—"I have not been able to find any well-attested case of death from its inhalation. There may have been such, but they have never come to my knowledge, though I have taken unwearied pains to obtain information on this point." In Mr. Erichsen's work it is affirmed of ether, that "no death has yet resulted from its use." The surgeons of Lyons declare that "since the adoption of ether in place of chloroform the necrology of anæsthesia has not received an additional instance" in

their city. Signor Palaschiano, of Naples, considers ether as infinitely safer than chloroform, in spite of the dangerous apparatus with which he administers it. Between these extreme schools of the belief in the perfect innocuity of ether on the one hand, and its equal danger with chloroform without the latter's advantages on the other, has arisen a third party, which admits that ether is certainly not so hazardous as the other agent, but that fatal cases have occurred from its employment. They believe, further, that were ether more extensively used than it is we should hear of a greater number of fatal cases from its inhalation. Ether is not employed as an anæsthetic agent to any extent in Great Britain and many parts of Continental Europe, but it is habitually used at Lyons and Naples, and is the only anæsthetic administered in the principal hospitals of the United States of America. We are informed that in the Massachusetts General Hospital at Boston, where it was first given, and has since then always been resorted to, no deaths have ever taken place, nor anxious apprehensions been excited, either during or after its inhalation.

An important question is, then, apparently undecided; and no means should be left untouched by which we may arrive at a definite opinion upon such experience as the profession has hitherto gained. The Boston Society for Medical Improvement has, we are glad to find, seriously taken up the matter, and has appointed a committee "to investigate the alleged deaths from the inhalation of sulphuric ether, and to report thereon." The vast interest attached to a truthful solution of the point at issue warrants us in urging our medical brethren to communicate to the chairman of the committee (Dr. Hodges) accounts of all cases which have already or shall hereafter come to their knowledge in which a fatal issue appeared to result from the use of ether. It will be essential not only that the place, time, and circumstance of its occurrence be noted along with the mode of inhalation adopted, but that specific attention be paid to the following points:

1. The kind of ether used—whether *pure sulphuric ether, chloric ether, or ether combined with chloroform.*

2. The period after inhalation at which death occurred.

Hospital Reports and Case-Book.

NECROSIS OF THE ASCENDING RAMUS OF THE LOWER JAW IN A BOY; SUCCESSFUL REMOVAL.

(UNIVERSITY COLLEGE HOSPITAL. Under the care of Mr. ERICHSEN.)

(From the 'Lancet,' April 6th, 1861.)

Necrosis of the jaws is a disease not commonly witnessed in the young, except as the result of some form of injury, of struma, or from the effects of the fumes of phosphorus. A case, however, presented itself, in which neither of these could be stated to be the direct cause of the disease, as it followed the simple extraction of a back molar tooth. The patient was a lad between nine and ten years of age, otherwise in good health, in the right side of whose mouth could be distinctly felt a projecting piece of dead bone, near the second molar tooth of the lower jaw. The aperture through which the bone protruded was large, but Mr. Erichsen could not say to what extent the bone was affected until he had endeavoured to remove it. The face was quite swollen. When narcotized with chloroform, on the 27th of March, an effort was made to extract the bone; only a few fragments were got away with forceps, yet there seemed to be a large sequestrum remaining. The aperture was therefore enlarged, and by the aid of strong forceps the bone was well laid hold of, and gradually extracted. Its extent seemed astonishing, for it comprised the whole of the right ascending ramus and coronoid process of the lower jaw, with the exception of the condyle. This had been partially jammed into the shell of new bone, and was not easily extracted until the aperture was enlarged, as already stated. The sequestrum involved the entire thickness of the lower jaw, and was situated somewhat to the inner side of the new bone. Mr. Erichsen believed that the condyle remained in connexion with the case of new bone, and had not lost its vitality. The boy would, therefore, have good motion in the temporo-maxillary articulation at a later period, and would no doubt make a good recovery.

An interesting point in the treatment of this case was the removal of a sequestrum

from the situation it occupied, in the present instance, entirely through the mouth, without making any wound in the cheek, notwithstanding that there was more trouble in thus getting it away. Some surgeons would not have hesitated to perform a sort of partial resection of the jaw in this case.

FIBROUS TUMOUR OF THE ANTRUM, WITH PULSATION; EXCISION; RECOVERY.

(ST. BARTHOLOMEW'S HOSPITAL. Under the care of Mr. PAGET.)

(From the 'Medical Times and Gazette,' March 9th, 1861.)

THE subject of this case was a very healthy-looking lad, aged 18. He said that, seven years ago, a swelling of the face commenced, which had gradually increased up to the time of his admission under Mr. Paget's care.

December 18.—There is now on the left side a general projection of the cheek. On examination this is found to be due to prominence, chiefly in three directions, connected with the superior maxillary bone. It projects just below the malar bone and above the alveolus, and thence upwards and into the orbit, displacing the eye for at least a quarter of an inch. There is no yielding in the first direction, and very little in the one in the orbit, but in the last situation, where it is not covered by bone, there is slight but well-marked pulsation. The diagnosis is that of tumour, originating in the antrum, which has entered the orbit through an opening in its floor. It has not at all encroached on the nasal side, nor is the palate or alveolus depressed.

Before the operation Mr. Paget remarked, that the directions of the extension of the growth supported the opinion of its being a fibrous tumour in the cavity of the antrum, rather than a tumour of the bone itself. The parts of the maxilla over the tumour felt firm and unyielding, but the tumour, where it had escaped into the orbit, communicated a slight feeling of pulsation

to the finger. This was very slight, but it was very decided, and it was synchronous with the radial pulse. In reference to this symptom, Mr. Paget said that, taken alone, it was a symptom of malignant disease, but in this case it was the only one. The excellent health of the patient, the very gradual growth, and, as he believed, its not affecting the bone, rendered that idea quite untenable. There were cases, he added, in which hard tumours pulsated. It was difficult to give a satisfactory explanation. Sometimes it appeared to be due to an artery overlying the tumour. There were cases in which tumours of bone pulsated without any apparent excess of vascularity. In reference to the operation, Mr. Paget said that he should endeavour to remove the tumour from the mouth, without cutting through the cheek; and he should, if he did not succeed in doing so, endeavour, at least, to save the alveolus and palate.

Chloroform having been administered, Mr. Paget made an incision down to the bone above the alveolus, separated the cheek for a little way, and then, by a Hey's saw, cut into the antrum. It was not, however, possible, in such a small wound, to open the antrum freely. He therefore

made an incision in the cheek, commencing near the angle, and carried upwards in the direction of the outer commissure of the eye, for about an inch and a-half. He then removed, by the saw and cutting-forceps, part of the anterior wall of the antrum and a little of the attachment of the malar bone, and from this opening he was enabled to remove the tumour. It filled the antrum and extended upwards into the orbit, not only in front, where it was present before removal, but also largely into the back of that cavity. The tumour was removed almost entire. It was smooth on its surface, and grew from the wall of the antrum, the portion removed, by a small attachment. It was larger than was expected before removal, about the size of a small orange. On section, it was white, firm, tough, and yielded no juice on scraping. It was, Mr. Paget said, an ordinary fibrous tumour, the most common form of tumour which was found in the cavity of the antrum.

March 4.—The operation was performed on December 18. The boy has done uninterruptedly well, and is now about, only a very small part of the wound on the cheek remaining unhealed.

British Journal of Dental Science.

LONDON, APRIL, 1861.

At a time when the dental practitioner is formally accepting a professional position by the acquisition of a legally constituted professional qualification, it will not be considered a waste of space if a few pages are from time to time devoted to the consideration of the obligations and the privileges of a professional position—to those proceedings in the conduct of business which are sanctioned by the general consent, and to those which are as generally condemned by professional men. Upon the question of professional advertisements there appears to be no difference of opinion, but some difficulty may arise in determining what constitutes an advertise-

ment. The distinction between an advertisement and a notice is generally well defined, but it is not uncommon for those who wish to sail near the wind without sacrificing their position, to use the one as a covering for the other. If a practitioner changes his place of residence it is convenient to make the removal known to those who employ him, and this may be done by a simple statement of the fact twice or thrice repeated in the 'Times' or some other paper. But when a change of residence is made a pretext for the insertion in numerous papers, over a considerable period of time, of the name, profession, and address of the

practitioner; the form of a notice is made to serve the purposes of a professional advertisement. The man parades his name and occupation before those who have no interest in his movements, with the view to attract their notice. He, in fact, touts for practice under the pretext of a change of residence.

Other practitioners of this class make a worthless pamphlet the mask for professional advertising. The title of the pamphlet comes first, then the name and address of the author; followed, perhaps, by the hours during which he may be found at home. This kind of advertisement is repeated, time after time, to an extent that renders it impossible that the sale of the work, however great, can cover the mere cost of advertising.

A dissolution of partnership, or the transfer of a practice, either the one or the other, may and sometimes is made the excuse for a series of notices, which, by repetition, become nothing more or less than mere professional advertisements.

These sinister attempts to secure the advantages of advertising, while the general forms of professional conduct are observed, are justly regarded with quite as little favour as open and systematic advertising. A barrister advertising for briefs, or touting for practice among solicitors, would, in the latter case, lose his position at the bar; and, in the former, be disbarred by the benchers. A solicitor—a member of the Law Institution, if detected in advertising for practice, would have his name struck off the books of that institution. A member of the Stock Exchange would lose his membership if he advertised for employment. A clergyman would be the subject of ridicule if he advertised himself as a fit subject for the gift of a living. A member of the medical profession is scouted as a quack, if he advertises for patients.

The strong conviction common to all professional men, that the use of professional advertisements is in itself indecorous, and highly offensive, involves

the existence of a general principle of professional conduct, in the violation of which the advertiser degrades himself from the level of a professional man, and the profession, so far as he represents it, to the position below that of a trade. This principle is founded upon the fact that professional services can be accurately estimated only by professional men, while those who require them may judge of the ultimate result, but they are wholly incapable of judging correctly of the merits of the respective steps by which the final result is gained. Hence it becomes necessary that the client or the patient should repose implicit confidence in the integrity and skill of his professional adviser. The right to this amount of confidence depends upon the personal merits of the practitioner, and he is the last person whose opinion should be either given or accepted upon a question on which his judgment cannot be impartial. It therefore is very justly regarded by society as an offence against good breeding for any one to set forth his own merits, or to call attention to his own attainments and capabilities. It is an admitted weakness to receive as evidence laudatory statements from a person in favour of himself, and he who adduces such evidence is regarded as vain and foolish when no further object is gained than the pleasure of boasting, and as little better than a knave when substantial advantages are thus sought.

A professional man must be sought by those who require his services, and the application implies confidence in his power to render the required aid. The practitioner is thus placed in a position of trust, and it remains for him to show, by the manner he executes the trust, whether he is bound by honorable feeling or otherwise; whether confidence can or cannot be rightly reposed in him. If he be an honorable man, with fair professional capabilities, his treatment of the matters submitted to his care will secure to him the confidence of those who sought his aid, and his future success will be secured;

but if he be influenced by purely selfish motives, and is led to neglect the interest of his employer in order to enhance his own gain, or if he be an incompetent person, each transaction becomes a record against him, and an impassable barrier is raised by his own hands against his legitimate success. All who can speak of him from experience speak unfavorably. Failing, from one or other of these causes, to inspire confidence in those with whom he has been thrown in contact, and through whom his future progress should be secured, he addresses himself to strangers; he touts, or becomes an advertiser—a course the adoption of which is a public acknowledgment that he cannot succeed by the means sanctioned by professional usage. He admits that others will not speak for him, therefore he must speak for himself; and he must speak to those who know neither his antecedents nor his professional capabilities. He must address himself upon a personal question—~~his~~ ^{his} own success—to strangers, and endeavour to persuade them to hold him in that repute which his acquaintances have denied to him.

The tradesman advertises his goods, the quality of which may be examined by the purchaser.

The degraded professional man advertises directly or indirectly his professional capability—a commodity which cannot be examined; it must be accepted on faith; and the inability to discontinue the use of advertisements by those who have adopted them shows that one trial is quite sufficient to convince the client or patient of the merits of the advertising practitioner.

In professional life it appears to be a constant rule—once an advertiser, always an advertiser. Connexion is not gained by advertisements, and a man capable of making a connection does not attempt to gain by advertisements that which can be obtained by means which do not involve the loss of professional character.

Few men of worth will be found to accept a doubtful position, and it becomes

a disgrace to accept one which carries with it its own condemnation. Hence it is that those who attempt to conduct a profession by advertisements are necessarily men of low cast, who, having no sense of personal dignity, fail to feel the indignity which they accept in their public appeals for personal consideration.

The challenge to publish in this Journal the names of those members of the College of Dentists who advertise, in order to substantiate a charge which the organ of the College has failed to shake, is but a specious attempt to reduce a general to a personal question. We object to the use of advertisements as unprofessional, and to institutions which encourage the practice of advertising; and we cannot admire the conduct of a pretentious body—a College—which, after accepting the support of a number of men, whose habits as advertisers are sufficiently known, urges us, through its organ, the 'Dental Review,' to print, in a long list, their names, and thus place them in a most unenviable position, not only before the members of the College of Dentists, but before the whole body of the Dental profession. We do not blame advertising dentists for joining the only body which will accept their support; but we do censure an institution which, arrogating to itself a name in imitation of the great medical corporations, under the shallow pretence of advancing the interests and raising the status of the Dental profession, associates itself with the advertising dentists, and then, with the hope of escaping the merited censure, endeavours to obscure the bearings of a general question, affecting the interests of every member of the profession, by the substitution of a personal dispute between certain advertisers and the editor of a journal. It is for the executive of the College of Dentists to deal with its advertising members individually; and it is for us, as journalists, to criticise the acts of the College, or of any other public body, so far as they have any bearing upon

the Dental profession; but we have nothing to do with the acts of private individuals, unless they assume a public character. Our acquaintance with the names of those who are members of the College of Dentists is gained solely through the 'Dental Review;' and in the lists there published we find, excluding repetitions, about 124 names, upwards of twenty-five of which we have seen associated with newspaper advertisements of greater or less length. In the attempt to answer our allegation, we find in the April issue of the 'Dental Review' the following passage:—"Again, it is said that "a greater number than three (advertisers) have been elected by the College of Dentists, even at the last two meetings." The simple answer to this is, that no three members have been elected at the last meetings of the Council." In writing the phrase quoted in the foregoing paragraph, we alluded to the lists of new members published in the February and March numbers of the 'Dental Review,' the former list containing eleven, and the latter eight names; and we again assert that these two lists contain the names of more than three advertising dentists. We would ask, of what avail is this poor equivocation? If these men were not elected at the last two meetings of the Council of the College, their names were published as newly elected members in the two last numbers of the organ of the College.

Whether a certain list of names appear, or not, in this journal in no way affects the issue of the general question, as to whether professional advertising is, or is not, consistent with the maintenance of professional character, in the usual acceptance of the term; neither will the absence of such list prove that we are unable to give the names, and a reference to the advertisements to which we, in common with many others, have seen them appended.

But the course adopted by the College of Dentists may be accepted as a satisfactory proof that its weakness has necessitated a series of acts which it is unable to

defend. Had the College elected, in ignorance, advertising dentists, on the general fact being made known the secretary would have been instructed to obtain information upon the subject, and each case would have been dealt with upon its own merits; but the injustice of bringing, by direct or indirect means, the names of their members before the public would not have been entertained.

To accept the support of men, and then, without any change in their professional conduct, cause their names to be published, as unworthy of the position assigned to them, is a meanness for which we should not have given the College of Dentists of England credit.

ON Thursday, the 25th of this month, a dinner will be given in aid of the funds of the Dental Hospital of London, and Professor Owen will preside.

To Hunter's great work on the teeth the rise of dental surgery as a ^{real} branch of surgery may be traced. To the great anatomist to whose guardianship the Hunterian collection was for many years intrusted, and under whose care the collection has been so vastly increased, and from whose hand it has received its present arrangement, odontological science is scarcely less indebted. The dental surgeon is not more indebted to Hunter than is the scientific dentist to Owen.

Were it only to show our appreciation of the valuable services rendered to us in the great additions he has made to our knowledge of the subjects directly or indirectly pertaining to dental science, the members of our branch of the medical profession should, on the present occasion, tender their personal support to Professor Owen. He comes among us for the expressed purpose of rendering assistance and encouragement to an educational institution, the progress of which cannot fail to exercise a very important influence upon the position and prospects of those who may in future practise dental surgery.

It is our own cause he comes forward to advocate, and it is for us to give that advocacy effect by showing our own earnestness in the cause. The general hospital is equally a necessity to the poor and to the surgeon; to the one it affords relief from suffering, to the other an opportunity for the acquirement of professional know-

ledge. The Dental Hospital is not less necessary to the dental surgeon, and should we show by our apathy that we are incapable of appreciating the value of a public institution devoted to the practice of our special branch of surgery, it will be long ere men holding the position of Professor Owen will again lend us their aid.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

To the Editor of the 'British Journal of Dental Science.'

SIR,—Will you permit me to express through your columns my great regret to those gentlemen who are Licentiates in Dental Surgery of the College of Surgeons who did not receive an invitation to be present at the dinner which took place at the "Albion" on the 18th of this month, to commemorate the first examination held of the Dental Board, for the omission they were the subjects of. I am alone to blame, and therefore beg to offer my personal apology to those who may have been overlooked. The difficulty I experienced was to find out who had passed since Churchill's

'Medical Directory' for this year was published, and it is amongst those who have passed since that directory was published, that I appear to have been at fault.

I trust I need not assure any gentleman that the desire of the dinner committee was to have *every* licentiate invited, and that they feel in common with myself much regret that any should have been omitted.

Yours, &c.,

EDWIN SERCOMBE.

49, Brook Street; March 16th.

[This note was intended for publication in our last, but arrived too late.—ED.]

Literary Notices and Selections.

CAST OF THE MOUTH OF A CHILD, THE SUBJECT OF CONGENITAL SYPHILIS.

(PATHOLOGICAL SOCIETY OF LONDON, Tuesday,
March 5th, 1861.)

(From 'The Lancet,' March 16th, 1861.)

MR. NUNN showed casts of teeth from a girl with strong manifestations of syphilis in other parts of the body, observing that the stunted and deformed characters there seen corroborated the views of Mr. Hutchinson respecting the syphilitic origin of such teeth, which were well known to the society.

Mr. THOMPSON thought it was important that the conclusion should not be arrived at that defective teeth of this kind were necessarily the result of a syphilitic taint. He had carefully examined Mr. Hutchinson's cases, and was satisfied that these were syphilitic; but he had seen many others, respecting which he was equally satisfied that no taint existed. The real state of the case appeared to be that stomatitis of any kind would produce defective teeth, but that syphilis was the powerful and most common agent in producing them. Mr. Hutchinson did not say that all notched and malformed teeth

were due to syphilis, but he (Mr. Thompson) thought that there was an impression abroad that such had been regarded as the case.

Dr. GRAILY HEWITT agreed in the main with what had fallen from the preceding speaker, but was satisfied that the cases he had seen of Mr. Hutchinson's (as one also of the committee for reporting on them) were of syphilitic origin.

Mr. NUNN thought that Mr. Hutchinson's subsequent paper, in the tenth volume of the society's 'Transactions,' had been overlooked in the discussion. Mr. Hutchinson there distinguished the different forms of malformation observed.

Mr. HULKE thought that some of the cases were syphilitic, but in many proof was wanting that these imperfectly formed teeth were due to syphilitic taint.

Mr. BARWELL had a case under his care of well-marked malformed teeth of this kind, in the origin of which he was certain that there was nothing syphilitic. He believed that in any strongly marked case of cachexia such appearances might exist, whether in connexion with rickets, scrofula, or other diseased constitutions.

CASES OF CLOSURE OF THE MOUTH.

(From 'The Dental Cosmos,' March, 1861.)

PROFESSOR REINA has had occasion to observe four cases of a new form of morbid closure of the mouth, due, not to ankylosis of the articulation of the jaw, but to hypertrophic thickening and induration of the membranous muscular tissues of one or both cheeks. Syphilis, scrofula, or the irregular and violent extraction of a molar tooth, were the causes of this alteration, and the closure led to much difficulty of respiration and speaking, and interposed an obstacle to the introduction of solid food into the mouth, from which resulted the

various consequences of insufficient nutrition.

To remedy this deformity, Professor Reina divided, by means of a bistoury, the hypertrophied tissues, repeating the incisions whenever they became necessary, and incising transversely the mucous membrane, from the angle of the jaw to the commissure of the lips. The buccinator and orbicularis oris were entirely divided; it became necessary, also, more than once to divide the anterior pillar of the velum palati and the glosso-staphylinus muscle, and in such case the operator was, moreover, obliged to relax the corresponding side of the tongue, which adhered to the interior of the gum. The arterial hemorrhage was combated successfully by compression.

With the help of conical pieces of cork introduced between the teeth, the abduction of the jaws was facilitated, at the same time that an obstacle was interposed to the union of the divided parts. Finally, the diatheses were combated by general treatment, mercurial or iodized, according to the special indications.

A REMEDY FOR PTYALISM.

(From 'The Dental Cosmos,' March, 1861.)

Dr. ROBERTSON has found (Druggist) that the *Ambrosia trifida* has more prompt remedial powers in cases of excessive ptyalism than anything he had ever previously tried. His patients are described as being generally relieved in six or eight hours of the most urgent symptoms, and completely cured in two days. The preparation employed is an infusion of the green leaves, used frequently as a gargle. Dr. Robertson suggests that the plant may be found useful in other profusives—as leucorrhœa. The plant is known under the popular name of horseweed, horsemint. Dr. Robertson was induced to try it from observing that it completely cured a horse affected with slobbering.

Dental News and Critical Reports.

HOSPITAL APPOINTMENT, QUEEN'S COLLEGE, BIRMINGHAM.

At a Special General Meeting of the Governors of this hospital, held on Monday, March 25th, 1861, Mr. Samuel

Adams Parker, a Dental Licentiate of the Royal College of Surgeons, and Member of the Odontological Society, was unanimously elected Dental Surgeon to the Hospital.

THE ODONTOLOGICAL SOCIETY.

THE MONTHLY MEETING of the Members of this Society took place at their Rooms, 82, Soho Square, on Monday evening, April 1st, 1861: WILLIAM MINSHULL BIGGS, Esq., President, in the chair.

The minutes of the last meeting having been read and confirmed,

The following contributions to the library and museum were announced, and the thanks of the Society accorded to the respective donors:—

To the museum, by Mr. Parkinson, Sen., of Sackville Street:

Fossil tooth of Mastodon. Fossil tooth of a shark found at Alexandria, in Egypt, supposed to belong to one of that species that must have been more than thirty feet in length, for, on comparing it with one in the British Museum, seventeen feet long, this was just twice that size. A fossil tooth of the *Ichthyosaurus*. The canine tooth of a tiger.

And to the library, by Dr. S. S. White, of Philadelphia:

Vol. i of 'Dental Cosmos.' 'Dental Anomalies,' vol. 1. Two copies of coloured plates of Fifth Pair of Nerves, with diagrams illustrative of the Microscopic Anatomy of the Teeth. Two copies of Key to the same.

By Mr. Truman:

Romberg on 'Diseases of the Nervous System,' 2 vols. F. Oesterlen's 'Medical Logic,' 1 vol. T. Sydenham, The Works of, and Translation by, Dr. Greenhill, 3 vols. Schwann and Scheridon's 'Microscopical Researches into Accordance in the Structure and Growth of Animals and Plants,' 1 vol. Unzer and Prochaska, 'On the Nervous System,' 1 vol. Wedl's 'Pathological Histology,' 1 vol. Harvey, M.D., Works of, 1 vol. Hassse's 'Pathological Anatomy,' 1 vol. On Small-pox and Measles, 1 vol. Churchill, 'Diseases of Women.' Feuchtersleben, 'Medical Psychology.' Dupuytren, 'On Diseases and Injuries of Bones,' 1 vol. 'On Lesions of Vascular Systems,' 1 vol. Hunter's 'Gravid Uterus.' 'Memoirs of the Academy of Surgery.' 'The Genuine Works of Hippocrates,' 2 vols. Kölliker's 'Manual of Human Histology,' 2 vols.; 'Annals of Influenza.' W. Hewson's Works, edited, with an Introduction and notes, by G. Gulliver, F.R.S. Rokitanaky's 'Pathological Anatomy,' 4 vols. Küchenmeister's 'Manual of Parasites,' 3 vols. Von Siebold 'On Worms.'

The following gentlemen were then elected members of the Society.—Resident: Mr. George Laurie, 26, Mortimer Street, Cavendish Square. Non-resident: Mr. Samuel Parker, Colmore Row, Birmingham. Corresponding: Dr. Dunning, New York.

The PRESIDENT.—You are aware, gentlemen, that at our last meeting the discussion on Mr. Bridgman's paper was

adjourned. We then hoped Mr. Bridgman would have been present this evening to take part in the discussion. I am sorry to say we have received a letter from him, stating that he is not able to attend; and under existing circumstances, not seeing around me those gentlemen I presumed would be here—particularly one, who, for the sake of doing justice to the subject, moved the adjournment of the debate—I think it may be better to postpone the discussion until Mr. Bridgman can be present. It is very likely, on a future occasion, he will be here. His health is rather delicate; but that is not the only cause of his absence. It is owing, I believe, to some unforeseen circumstance that he is not with us to-night. Is it your pleasure that this discussion should be postponed until a future occasion? I hardly see how we can act differently, when Mr. Bridgman is not here to defend his views.

Mr. CARTWRIGHT.—I think it would be much better, for the interests of the Society, to put off the discussion till a future occasion.

The PRESIDENT.—Will any gentleman propose that?

Mr. CATTLIN.—In the letter to which the President has alluded, Mr. Bridgman expresses a desire that an opportunity may be afforded him of answering such arguments as shall be advanced against the views set forth in his very interesting and scientific paper. The Society has no power of giving Mr. Bridgman this advantage, to which he is entitled, except by again adjourning the discussion. I, therefore, beg to move that the discussion upon Mr. Bridgman's paper be adjourned until the next meeting. This course is in every way desirable, inasmuch as, on account of the Easter holidays, many Fellows who would have taken part in the debate are now absent.

Mr. FLETCHER.—I have great pleasure in seconding Mr. Cattlin's proposition.

The motion was put, and carried unanimously.

Mr. COLEMAN then read the following paper:

On the Nature of Dental Caries.

Mr. PRESIDENT and GENTLEMEN,—It may appear a bold step to introduce any new theory which proposes to explain more satisfactorily the nature of a disease which, from its very frequency, must have attracted considerable attention, and which

has, almost of itself, called into existence the profession of which we are members. But it must appear a still bolder step to advance views which differ considerably from those which have hitherto been adopted by men of the highest reputation. It may be supposed that no individual would undertake so great a responsibility unless his ideas were the result of long observation, or unless they explained more satisfactorily a large number of phenomena, or unless they were confirmed by decisive experiments.

To the first of these conditions I can lay no claim. To the second I can only say that, to my mind, they explain more clearly the nature and process of caries of the teeth. To the third, however, I may observe that the experiments I have performed can, in my opinion, be explained by no other than the views I am about to advance.

I should have preferred waiting until I could have laid claim to all of the above conditions, but that our attention cannot fail to be drawn in an unusual degree to this disease at the present time by a paper, remarkable for its comprehensiveness and originality, read at the last meeting of this Society by Mr. Bridgman.

All opinions which have been advanced upon the nature of caries of the teeth, which in any way recognise the action of agents external to those organs having an influence upon, or taking a part in, the changes they undergo, regard, I believe, the existence of an acid of some kind as essential; and consequently, looking no further for a cause, attention has been somewhat misdirected in investigating this subject.

Following out the researches of others, I confess I was somewhat surprised, in investigations carried out a few years ago, to find so little evidence of acid fluids in the mouths of many persons whose teeth presented the conditions of rapid decay. In the cavities themselves I found invariably an acid reaction; but occasionally an alkaline reaction was discovered in the saliva of those in whom, *à priori*, we should have anticipated strong acid reaction. The saliva is considered, I believe, as I have generally found it; to be usually neutral; but it is stated to vary under different conditions of the body. Thus, whilst any great demands are being made upon any of the acid secretions of the body—as, for instance, in the stomach during digestion—the saliva is found to be alkaline; whilst before a meal,

when other and alkaline fluids have been more recently drawn upon, the saliva is found to possess an acid reaction. Be this as it may, this secretion, though of course ever in contact with the teeth, has never to my mind presented a sufficiently acid character, of itself, to account for the rapid disorganization we find going on in the teeth of certain individuals.

The acid found in the cavities of the teeth has been accounted for by the action of the decomposing tissues of these organs upon certain of the constituents of our food; but I think it is more probably due to the formation of an acid phosphate of lime furnished by the decomposition of the lime-salts of the dentine. Bone-earth, exposed to warmth and moisture—conditions favorable to decomposition—undergoes a kind of putrefactive fermentation, and furnishes the same acid phosphate of lime (the superphosphate) that is produced by the action of sulphuric acid on the same substance.

That it cannot be due to the decomposition of the decalcified dentine alone, is proved by the following experiment. From the cavities of a large number of recently removed teeth the softened dentine, previously cleaned with dry cotton, was removed, and macerated in water. The reaction, which at first was nearly neutral, soon became decidedly alkaline—a condition we should have anticipated in the decomposition of a nitrogenous compound.

If it arise from the action of the decomposing tissues on certain constituents of our food producing lactic, butyric, or any other acids, we should scarcely find so strong evidence of its existence in those portions of the dentine which are hardly or at all softened, and which could to so small an extent only be permeated by the fluids of the mouth. This portion of the dentine I have found quite as acid in character as that removed from the more superficial portions of softened dentine in the same tooth.

In seeking for other than acid solvents capable of effecting a disintegration of the constituents contained in the teeth, we shall, probably, be aided in our investigations by observing some of the changes the food undergoes in its passage through the alimentary canal. The disintegration and solution which those substances undergo which enter the stomach as food, as well as some which occasionally find their way there by accident, cannot be traced to be due to any general solvent excreted from that organ; but partakes more of the nature

of a process analogous to fermentation than to any other—a process of decay or change due to the action of certain bodies of weak chemical affinity, which readily undergo a state of molecular change, and induce the same condition in bodies less prone to decomposition than themselves; the former are invariably nitrogenous compounds, which are the least stable of all compounds when of a complex composition. It is supposed that the molecular motion of these bodies is communicated to the particles of the more stable ones. Whether this be correct or no, we have the facts that decomposing gluten induces a change in grape sugar, converting it into dextrine, and then into alcohol and carbonic acid—compounds more simple in structure than those from which they were derived. Again, decomposing animal tissues, under certain conditions, will convert the same substance into lactic, butyric, and other analogous acids; and so also will the gastric and other fluids of the stomach, under the conditions of warmth, motion, and the presence of air, soften, disintegrate, and alter the chemical condition of substances used by us as food.

As the changes we wish to investigate take place in the mouth, it is to this the first of the digestive cavities of the body that our attention must be directed. Food introduced here is, we know, first subjected to the comminuting action of the teeth—organs mechanically well adapted for this office, and armed with an amount of sensitiveness to protect, no doubt, the stomach from the introduction of hard bodies that would injure its soft structures, as well as to afford a knowledge of the degree of comminution that has been effected. During this operation, that of intimately mixing the food with the saliva likewise takes place.

The saliva, we learn from the researches of physiologists, effects chiefly the following objects:—1. A chemical change in certain of the elements of our food. 2. The introduction of air into the stomach. 3. A viscid covering to the food, to enable it to glide freely along the dorsum of the tongue into the pharynx, in the act of deglutition, and from the pharynx through the œsophagus into the stomach. It is the more viscid saliva from the submaxillary, sublingual, and small glands, whose ducts open into the anterior part of the mouth, in which the two last-mentioned are chiefly effected, and into which fluid the food is rolled in the final act of mastication preparatory to deglutition.

But it is the first-named office of the

saliva, the chemical, that most concerns us; and this is chiefly found to be possessed by the more watery secretion of the parotid glands, the position of the orifices of whose ducts (Stenon's) are so situated, that the food becomes well mixed with it, whilst undergoing comminution by the molar teeth.

The action of the parotid fluids is expended chiefly in converting the amylaceous constituents of our food into grape sugar—an action which is suspended when the food undergoes another form of change in the stomach, but which is resumed in the duodenum and small intestines generally, when it is again exposed to analogous fluids from the pancreas and Bruner's glands.

Now, I believe, the change going on in the food whilst in the mouth, through the agency of the saliva, and especially in those portions which are detained there by lodging between the teeth, or in fissures in the enamel, communicates a molecular disturbance to those portions of a tooth which have had their vitality lowered, whether through disease of the dental pulp or periosteum, by exposure of the dentine through injury, or congenital deficiency of enamel, by exposure to frequent and considerable changes of temperature, by having suffered severe concussion, or by any other cause that might at all interfere with the normal condition of their nervous or nutrient supplies.

I am not disposed to refer this altered condition of the tooth-substance to necrosis, because we find necrosed tooth-substance, or bone, very unsusceptible of undergoing change. It may be in the condition in which we find ivory, which readily undergoes absorption when introduced into the substance of the bones of animals (a condition not improbably like that the temporary teeth are in at the time they are undergoing absorption), or in that the stomach may be in immediately after death, when digested by its own gastric juice, or in a condition analogous to the tissues which suffer absorption in the line of demarcation, when a mortified part is undergoing a natural separation. A condition I have occasionally remarked in some teeth would almost seem to suggest a fatty degeneration. We know calcareous degeneration of these organs to exist; but my observations have been too limited to do more than suggest a probability of the former.

The conclusions I have therefore arrived

at are, that certain portions of our food, especially bread and vegetable substances generally, owing to the changes continually going on in their amylaceous constituents in the mouth, may, by their continued contact with a tooth in the abnormal condition just spoken of, communicate a change to its particles, and induce in it a disintegration or decay. I do not deny that the presence of a free acid may not assist, or even be necessary to this change, as we find it is in the digestion of food in the stomach; but that acids are not the sole, or even the most important agents in this process, I think the following experiments will clearly show.

A number of recently removed teeth having been obtained, the carious and softened portions of the dentine were carefully removed, leaving only the hard dentine exposed. Several teeth thus prepared were placed in glass vessels loosely corked as follows:—Those placed in vessel 1 had some roast meat finely divided and water introduced with them. Vessel 2 had the same, only some saliva was added. To those in vessel 3 a strong solution of cane sugar was added. Vessel 4 contained the same, with saliva added. Vessel 5 had, besides the teeth, a small quantity of bread and water; and vessel 6 the same, with saliva added.

These vessels and their contents were exposed to a temperature of about 100° Fahr. (that of the mouth) for a period of twenty days, and then examined, when the contained teeth presented the following conditions:—Those in vessels 1 and 2 had undergone no change whatever, the dentine being quite as hard as when put into the vessels; the meat had undergone putrefaction, and the fluid was strongly alkaline. The teeth in vessels 3 and 4 were thus affected:—In 3, the change in the dentine was so slight as to be scarcely appreciable; but those from vessel 4, where we remember saliva had been added, had the exposed dentine considerably softened. The contents of these two vessels were strongly, though, I should say, about equally, acid. The greatest change, however, I found in the dentine of the teeth from vessel 6, where to a small quantity of bread and water saliva had been added. The softened dentine could readily be removed in thickish flakes. Vessel 5 had its teeth in about the same condition as were those in vessel 3; the decomposing teeth had probably effected to a small extent the same results as the saliva had. The fluid

in vessels 5 and 6 was only slightly acid. The result of these experiments must, I think, lead us to dismiss from our minds the necessity for insisting on the presence of a free acid as the sole cause of dental caries. The teeth contained in vessel 6, immersed in a fluid only slightly acid, were much more altered and softened than those in vessel 3, which were exposed to a far more acid fluid. The character of acid in the last fluid, also, ought to have been chiefly that which is known to possess a considerable solvent action on phosphate of lime; but, as the decomposed bread in vessel 6 would probably also have generated some of the same acid, the liquids from both were subjected to analysis—when the saccharine fluid was found to contain by far the larger quantity of lactic in addition to other acids.

Finally, microscopic appearances seem to confirm these views. A comparison of sections of dentine from the three following sources, viz. (1), from a carious tooth, (2) from a tooth removed from vessel 6, and (3) from a tooth decalcified by an acid, showed a far greater resemblance between the two first, than between the last and either of the former.

A point of some interest in these experiments is the apparent greater destructive action of the commonest article of our food, bread, than of either of the two other substances experimented with. If the inferences I have drawn from them be correct, the frequent cleansing of the mouth with mild antiseptics ought to prove very beneficial.

The gradual breaking up of the dentine after it has become softened is, I think, better explained by the views here advanced than by any other; and we can also readily comprehend from them how the discharges, and decomposing particles separated from a carious tooth, may induce the like condition in the contiguous surface of a neighbouring tooth, which we so commonly find to be the case in practice.

I do not deny the possibility of disease arising in the bony portions of the teeth, from causes wholly unconnected with the presence of external agents, and which may resemble the diseases that occur in (it is true, the more vascular substance) bone. Specimens that have been preserved seem to prove it really to have taken place in the dentine; but I believe such cases are rather the exception than the general rule.

It is my intention, in addition to the repetition of the experiments here described,

to institute a variety of similar ones to ascertain the action of different articles of food on the teeth, the results of which I shall be happy to communicate at some future meeting of this Society.

The PRESIDENT.—We have all, I do not doubt, listened to the theory of Mr. Coleman with interest, and I am sure that all gentlemen here will respect his views, however much they may differ from him in opinion. The question before us has frequently been one of dispute. The vital theory and the chemical theory have formed the foundation of a great deal of controversy. We have had several papers brought before this Society on these subjects. We had an elaborate paper by Mr. Robertson, containing his views of the chemical theory. We have also the chemico-vital theory, advocated by Mr. Tomes, who is not present this evening, or he might have entered into this discussion. I have no doubt, however, that there are some gentlemen present who will furnish us with their experience, and we shall be happy to listen to them.

Mr. HARRISON.—Before making any general observations on Mr. Coleman's paper, I should be glad to ask him what he found to be the prevailing acid, or acids, in the solution No. 6 (made with bread soaked in water, with a little saliva), which was most destructive to the teeth?

Mr. COLEMAN.—It was chiefly acetic acid; there was some butyric, and a small quantity of lactic, and some other acid; but it was chiefly acetic acid.

Mr. HARRISON.—I was induced to ask this question, sir, because all the papers we have had read, and all the theories that have been advanced on this subject, seem to amount to this,—that there is some acid, or combination of acids, essential to the progress of, if they do not produce, decay. In Mr. Bridgman's paper which we had last month, he spoke of one acid only, and confidently stated this to be lactic acid; although how he arrived at that conclusion he did not inform us, and that was one of the questions I meant to have asked him had he been present to-night. If I understand the paper with which Mr. Coleman has just favoured us, he advances no special theory as to the cause of decay, but merely states that he thinks it must be due to some other cause than the presence of a free acid—particularly lactic acid—inasmuch as, in the experiment which under his hands produced the largest

amount of lactic acid, the teeth experimented upon were not the most softened. He, however, admits that in that experiment the second greatest amount of softening had taken place, and states that, where the greatest amount of softening occurred, he found a large quantity of acetic, besides some butyric, lactic, and other acids. Now, sir, I have long entertained the opinion that decay of the teeth was more satisfactorily to be accounted for by what is called the chemical, than by the inflammatory theory—or, in other words, by the supposition that it depended upon the products of the decomposition of particles of food which lodge in the natural depressions in, and in the interstices between, the teeth; although I have never ventured on any theory as to the precise nature of the acid or acids producing it. And when we look into chemical works, and see a list of 160 or 170 different acids produced from the decomposition of various substances, and find different acids produced from the decomposition of the very same substances, in different stages, and consider what a variety of kinds of food and drink pass through our mouths, it must be apparent that it must be very difficult to arrive at any conclusion as to what the specific acid is which produces this effect, supposing it to be an acid. I have always thought it most probable that the teeth were subjected to the action of a *variety* of acids; and the answer which Mr. Coleman has given me to the question I have put to him goes far to confirm that opinion. I think, however, sir, that Mr. Coleman's paper, as well as Mr. Bridgman's, and I might say most of the theories we find in books, arrive pretty early at one point—viz., that an acid or acids are connected with the progress of decay—for even Mr. Tomes, although not a full believer in the chemical theory of decay, states in both his works, I believe, that it is very much promoted by the acids generated in the mouth. The only question on which we seem to differ, then, is this—whether these acids possess the power to *set up* decay in a tooth in which the vitality has not been previously affected by some other cause? That is the only point on which there seems to be any difference of opinion. Mr. Bridgman, in his paper of last month, arrives at this conclusion,—that what we call caries consists of two distinct stages—viz., “death of the tooth from vital action at the commencement, and then chemical decomposition afterwards”—and Mr. Tomes, in his

physiological work, has defined decay to be "death, and subsequent progressive decomposition of the whole or part of a tooth." But what we want to get at is, what *causes* the death which precedes this decomposition? My own opinion, looking at the number of cases of decay which come before us, is, that those easily referable to the causes which have been named, and dwelt upon, as producing this death, and consequent predisposition to decay, are so few compared with the number we see which we cannot refer to them, as not to meet the point at issue. Take lateral pressure, for example, which has been dwelt upon as one predisposing cause, by producing "molecular disturbance," rendering the teeth liable to decay. Lateral pressure can only exist between such teeth as are very much crowded; and we do not find it existing in the majority of mouths, even where the teeth are in contact—for contact does not necessarily imply pressure. I should say, that the cases in which lateral pressure capable of producing this effect exists are few, compared with those cases where you have contact without pressure; and that the amount of decay arising from this cause is very small indeed, compared with the numbers of cases in which decay either occurs between teeth where there is no pressure, or in which it commences in the natural depressions of the molar teeth. From what, then, does the predisposition to decay arise in these interstices and these depressions? They certainly are not subject to any pressure which would give rise to molecular disturbance, and so predispose them to decay. Another class of cases which has been mentioned are those in which the teeth are rendered predisposed to decay from severe malignant fevers. I am willing to believe—and I do believe—that scarlet fever, typhus fever, smallpox, &c., when severe, may all produce effects upon the teeth which predispose them to decay (and probably in the manner described by Mr. Bridgman); but these cases, again, are few compared with the number of cases that come before us. There is a third cause stated, viz., "mechanical injuries"—the cases arising from which, we all know, are comparatively rare; and a fourth cause, "ordinary exposure to cold"—which, I believe, rarely produces any injurious effects on healthy teeth. These, sir, I think, constitute the only predisposing causes ordinarily advanced and

dwelt upon by the opponents to the chemical theory; and I should say that, if you put the whole of the cases produced by these causes together, they would probably not amount to a tithe of the cases we every day see. Where, then—I am speaking, of course, without meaning this to be considered an exact calculation, but supposing it to be an approximation to the truth—where then, I would ask, are we to find the predisposing as well as exciting causes to decay in the other nine? In my belief, sir, in the acids, or combinations of acids, generated in the manner which Mr. Coleman has so satisfactorily proved by experiments, and which I have long believed, from observation and reflection, to be sufficient to account for both. I think that this opinion is borne out, if not proved, by the fact, that we invariably find decay to begin (except in those cases where you have some injury to account for it) either between the teeth, or in the natural depressions on their surfaces, or on such other parts as food may lodge. I will not detain the Society longer, sir, but conclude by repeating my belief that these acids, or combinations of acids, so frequently referred to, have the power, from long-continued application to the parts of the teeth named, to *originate*, as well as to complete what we call caries. (Hear, hear.)

Mr. CATTLIN.—I am afraid, sir, our observations must necessarily be limited upon the paper now before the Society, inasmuch as we have only just agreed to adjourn the discussion of a similar subject. There is one objection which seems to me to apply to Mr. Coleman's experiments; namely, that they all appear to have been made upon dead and dry teeth, in which case they could not be influenced by the various causes of irritation, and would be more readily acted upon by chemical agents than *healthy living teeth*. I would ask Mr. Coleman whether the chemical condition of the saliva which he used in some of the experiments was tested.

Mr. COLEMAN.—With regard to the first portion of Mr. Cattlin's observations, of course, in all experiments of this kind, when we have not the full conditions that we should have if the teeth were in the mouth, it must be admitted that conclusions drawn from them are open to objection. At the same time the comparison of a large number of such experiments cannot fail, I think, to throw some

light upon this subject, especially when we recollect that 'natural teeth,' when introduced into the mouth as substitutes for those that have been lost, undergo a change very similar to dental caries. In reply to the second portion of Mr. Cattlin's remarks, I certainly did not test the saliva that was added to the different vessels; but as that saliva was added to all at the same time, and from the same source, I do not think its condition could at all influence the results.

I think the great point arrived at from the experiments is this, that in the vessels containing the largest quantities of lactic and other acids we had a much smaller amount of softening and disorganization of the dentine, than we had when there was a smaller quantity of acid present.

Mr. CARTWRIGHT.—Did you detect what the acid, or acids, were which existed in the smaller quantities?

Mr. COLEMAN.—Acetic acid, butyric, and some lactic acid—but a very small quantity as compared with the others.

The PRESIDENT.—I believe it is generally admitted that saliva in its normal state is alkaline?

Mr. COLEMAN.—Writers on physiology usually state it to be so, but the results of a large number of experiments on the subject showed the saliva to be most generally neutral.

The PRESIDENT.—I am rather surprised to hear you say there was so small an amount of lactic acid in the experiment most destructive to the teeth; for chemists have generally found that lactic acid has predominated, in the cavity of decaying teeth, and acted more freely upon dentine than any other acid. I think that is also Mr. Bridgman's theory. If I understand his paper rightly, I believe he said that where lactic acid was found (and dead membrane generates lactic acid) its action was most frequently the cause of their destruction.

Mr. HARRISON.—I rise, Sir, to make a few observations in answer to the objections Mr. Cattlin has urged against Mr. Coleman's experiments. He says, that these experiments, being made upon teeth drawn from the mouth, can scarcely be considered conclusive as to the effects such acids as were generated would produce on teeth in the mouth, inasmuch as these teeth were not so well able to resist the action of these acids, or chemical agents. Now, I think this objection has more apparent than real weight. Dead animal

tissue is prone to go through certain natural changes, such as decomposition, and so forth, spontaneously, but I conceive that you have only to apply a sufficiently powerful agent to a living tissue to destroy its vitality, in order to render it amenable to the same chemical laws. Take any escharotic you like—undiluted nitric acid, for example—and you may destroy with it the skin alone, or the skin, cellular tissue, muscles, and even the bone itself, in the living as well as in the dead body. It is only for the acid or other destructive agent to be strong enough, or, if weak, to be applied long enough, to overcome the resistance which the vital forces would offer it, and you reduce the living structure to a dead one, amenable to the same laws—and with reference to the teeth, we all know that their vitality, at all events, their active vitality, is very low. I think, therefore, that the acids in question, if applied to the living teeth long enough, would have in time, pretty nearly, if not quite the same effect upon them as if they were dead, inasmuch as they would first destroy the vitality of the parts attacked, and then disintegrate them.

Mr. CATTLIN.—In reply to Mr. Harrison, I would remark that strong acid, such as strong nitric acid, would destroy vitality, and act, perhaps, with equal power upon any tooth, living or dead. But, inasmuch as no such acid is formed in the mouth, it does not fairly apply to the question before us. I certainly believe that a *healthy living tooth* would be far more likely to resist the action of those acids to which Mr. Coleman has alluded than a dead and diseased tooth. Moreover, under natural circumstances, the saliva is often alkaline, and, in that case, would neutralise the weaker acids.

Mr. HARRISON.—I believe, sir, from my experience in surgery, that you could destroy the living tissue by a bread-and-water poultice, long enough applied. The production of such an effect, even from this simple application, would, I believe, be a mere question of time.

Mr. IBBETSON.—I think that considerable importance attaches to the remarks which have fallen from Mr. Cattlin. With regard to caries, it appears to be the general opinion that an acid of some kind is its exciting cause, but I believe that a predisposing cause universally exists, and that each predisposing cause is a diminution of vitality, owing to which the organ is unable to resist the effects of

the acid. For the reasons given by Mr. Cattlin, I do not think Mr. Coleman's experiments can be considered conclusive.

Mr. OLLIVE.—I would ask Mr. Coleman whether he found the same combination in No. 3 bottle, which contained the strongest lactic acid, as he did in No. 6. I ask the question because it appears, from what has been said, that certain combinations may possibly be more destructive than the mere presence or excess of any one of the acids mentioned.

Mr. COLEMAN.—As far as I was able to ascertain, I should think probably there was, to a certain extent; but in the formation, for instance, of lactic, butyric, and other analogous acids, by the action of decomposing animal tissues on saccharine fluids, the results are so uncertain that you may make the experiments several times and obtain different acids. It has been stated that acetic acid is never formed in this experiment; but Dr. Frankland recently informed me that he had found it, and many other acids, in some experiments carried out some time ago. In ascertaining the nature of the acids formed in these decompositions I did not attempt to make any very accurate analysis—indeed I believe it is almost beyond the powers of any chemist to do

so. My object was simply to ascertain the important fact, that the greatest amount of action on the teeth had taken place where there was a smaller amount of lactic and other acids present. I cannot think the experiments wholly useless because they have been conducted out of the body. I believe the condition teeth are in when recently removed from the mouth is one bearing a considerable resemblance to teeth predisposed to caries.

Mr. CATTLIN.—I did not at all intend to imply that the experiments conducted by Mr. Coleman were useless, on the contrary, as far as they go, I think they are very interesting.

Mr. COLEMAN.—I should have added this remark to those I made just now—that, should gentlemen who are better microscopists than myself agree with me in finding a considerable resemblance between carious dentine and that softened by the experiment I performed in vessel 6, I think it may be fairly concluded that like results ought to have originated from like causes.

The thanks of the Society having then been unanimously accorded to Mr. Coleman for his interesting paper, the meeting was adjourned.

The Month: Miscellaneous and Scientific Intelligence.

TANNIN AND GLYCERIN.

By J. H. M'QUILLEN, D.D.S.

(From 'The Dental Cosmos,' Jan., 1861.)

WE recently employed, with marked advantage, a saturated solution of tannin and glycerin in a case that came under our care, in which the integuments covering the hard palate had been raised to a blister, and then cracked down to the bone by a tightly-fitting gutta-percha denture, with a chamber in the centre. The mucous membrane, as might be readily supposed, was very much excoriated, and there was a slight discharge of pus from the fissure in the centre. On examining the under surface of the denture, the margin surrounding the chamber was found quite sharp and somewhat prominent; this was reduced so as to give

the margins a rounded form. The patient, however, was requested not to wear the preparation until the parts were healed. To facilitate this process, she was requested to paint the part, by means of a camel's-hair pencil, with the above solution two or three times a day. At the expiration of a week she felt something sharp protruding through the fissure, and on removing it found that a small portion of the palatine process had exfoliated. A very short time after this the parts were restored to a healthy condition.

We have also advised the application of this preparation after the extraction of teeth, and believe that it hastens the reparative process in a marked degree. The tannin, of course, acts as an astringent, and the glycerin as a demulcent; the two combined making a very pleasant and valuable remedial agent.

ATRESIA ORIS.

(From 'The Dental Cosmos,' Jan., 1861.)

MANY cases of the disease atresia oris, or closure of the mouth, present themselves to the notice of those attending the medical charities of Calcutta. It would appear that there are two forms of this disease; one in which the mucous membrane covering the front of the ramus of the lower jaw has been inflamed, and subsequently contracting, causes closure of the teeth, without narrowing to any considerable degree the opening of the lips. If the history of these cases be traced, it will be found that they have generally resulted from the cutting of the last molar or wisdom tooth having caused the gum to inflame. The other kind of closure of the mouth results from the indiscriminate and excessive use of mercury by native practitioners. The ulceration of the mucous membrane lining the gums and cheeks succeeds to the pyalism so produced, and, on the inflammation subsiding, the opposed ulcerated surfaces unite, and cause the jaws to be closed, and the opening of the mouth to be contracted. Both Dr. Fayrer and Dr. Partridge are accustomed to remedy the first accident in the same manner, by dividing the firm, contracted band of mucous membrane with a knife (one of the tenotomy knives is generally found to be most convenient), and then forcing open the jaw by an extending trivalve speculum. With a little attention to dressing, this plan generally succeeds. In the other species of atresia oris a similar plan was at first adopted. The adhesions were divided by a narrow knife, the jaws forced open by the speculum if necessary, and lint, dipped in oil, was pushed in to separate the recently cut surfaces. But the disease treated by this way alone had so great a tendency to relapse, that in the recent case Dr. Fayrer, in addition to the above, divided the skin at the angles of the mouth in a direction downward and outward, and though at first this occasioned a most lachrymose expression to the man's countenance, it ultimately perfectly succeeded, and he left the hospital cured.

(From 'The Dental Cosmos,' Jan., 1861.)

In the records of the Boston Society for Medical Improvement, published in

the 'Boston Med. and Surg. Journal,' the following account is given of a case of "sore mouth from filling a tooth with zinc paste:—Dr. Coale was called to a young lady suffering great pain in her face. Her lips, particularly the lower one, were very much swollen, and presented some erosions on the inner surface. There was some increase in the flow of saliva. With these, there was constitutional disturbance, shown by headache and fever. Mild saline aperients were prescribed, but the local symptoms became worse. Upon getting further at the history of the case, it was found that she had had two teeth filled, a week before, and the filling consisted of some new patented article that was inserted in the form of a paste, and then hardened. This filling was removed, and the symptoms, up to that time getting worse, immediately amended, and a day or two restored her to health. Upon examination, it was found that the filling was composed of oxy-chloride of zinc, made at the instant, by mixing the liquid and highly caustic muriate of zinc with the oxide of zinc. These make a paste which soon hardens or sets. Dr. C. found several other cases where the same effects had been produced in the same way. In one instance the soreness lasted more than a week, the patient being entirely ignorant of the cause. The substance has been largely circulated among dentists, with strong recommendations to use it; but it appears to be highly objectionable, and in some cases might produce very deplorable results, were such symptoms as were witnessed in this case protracted or developed to a greater degree."

(From 'The Dental Cosmos,' Jan., 1861.)

THE following method of treating india-rubber or gutta-percha, patented by Rudolph F. H. Havemann, of New Brunswick, N. J., is given in the 'Sci. Amer.:'—"The gum is dissolved in one of the well-known solvents, such as the bisulphuret of carbon, benzole, or chloroform, and a stream of gaseous chlorine is passed into the solution. The solvent is now removed by evaporation at a low temperature, when the new product appears on the bottom of the vessel in a plate of greater or less thickness, which, after drying, becomes perfectly hard and white, like ivory."

FILING TEETH PREPARATORY TO PLUGGING.

By D. VAN DENBURG.

(From 'The Dental Cosmos,' Jan., 1861.)

THE practice of filing V-shaped spaces between teeth, with the points of divergence at the gum, I regard as more objectionable than spaces with parallel walls, since the V-shaped spaces receive food more readily, and it becomes wedged more firmly in them, and is dislodged with greater difficulty. This, I know, is often denied; but a trial of both will convince the patient, if not the dentist, of its truth. These V-shaped spaces, also, perhaps more than any other (for spaces with parallel walls are more frequently found with a shoulder near the gum), are likely to permit filed surfaces to come in contact, and that too at the most dangerous point.

The first objects in filing a tooth are, to give access to the cavity, and to make a smooth and even surface. But the principal aim should always be, that the filed surface may not come in contact with another tooth, or so nearly approach another surface as to endanger it. It is sometimes difficult between molar teeth, when the cavities are small, to make easy access to them, without cutting away more of the teeth than is desirable, if we use the file alone for this purpose. I think a very excellent practice in such cases is to pass a thin separating file between the teeth, making just space enough to dress off the fillings and cutting away but little of the enamel. Then drill the cavity out through the grinding end of the tooth, and introduce the filling through the cavity itself, bringing up and finishing one face of it on the grinding surface. This practice avoids impairing the side of the tooth, leaves it in its original shape, and therefore offers no extra inducement to decay. When two teeth in contact are decayed, it will sometimes be necessary only to open but one cavity through the end of the tooth, cleaning and filling the other through this opening.

It is sometimes admissible to cut molar teeth with parallel sides, provided a shoulder can be left near the gum. That will prevent the future contact of the filed sides. But this shoulder should always come out from the tooth, with a rounded projection, making the outline of the space resemble the letter U. If the V-shaped space opening at the ends of

the teeth is always objectionable, and it surely is, a space of similar shape opening either upon the palatine or buccal sides of the teeth is almost equally so. A proportionably large surface of the tooth is flattened, with nothing to prevent its coming in contact, at some point where it has been filed, with the adjoining tooth, with a space, if any remains, well calculated to retain whatever lodges in it. The V-shaped opening at the ends of the teeth, though it may soon bring two filed surfaces in contact near the gum, will seldom close upon the whole surface, inasmuch as the teeth, in this case, must be canted over on the long axis of their roots; while with the side-opening space, in order to bring about full contact, the teeth have only to be rotated on the short axis of their roots; which less pressure evidently will accomplish. The fact is, that none of these spaces are safe, except they be used in connection with a shoulder to prevent contact; and a shoulder is never admissible, unless it present a perfect surface of enamel, or enamel and gold. In large cavities, therefore, when the teeth are necessarily much broken or cut away, all the exposed surface of bone should be excavated; but the rim of enamel adjoining the gum should, if possible, be preserved, and the filling brought out with a shoulder to correspond with it. In cases where this rim of enamel is broken down, and the cavity extends under the gum, a shoulder of the gold alone may be left to rest upon the adjoining tooth, and the space between the teeth left so as to bring them as nearly as possible parallel when this rest is found. The V-shaped space without the shoulder should never be used, and the V shape in connection with a shoulder, opening either at the ends or palatine sides of the teeth, should never, in my judgment, be used, unless the position or shape of the tooth leaves us no choice. Of the two, the palatine opening is certainly preferable. But the V-shaped space, with a shoulder opening on the buccal side of the class of teeth to which I now refer, viz., the molars, both small and large, is not only not objectionable, but very desirable, provided the space is of equal breadth at the shoulders and the ends of the teeth. Such an arrangement favours cleanliness perhaps more than any other, since mastication and the action of the tongue rather drive out food than wedge it in such a space.

Another excellent way to treat these teeth is to make the double V, or crucial separation, opening on both sides, and dressing the filling with two inclined faces. This is most advantageously used where two teeth are largely decayed on adjoining sides, and it is not convenient to make a shoulder. Then the fillings, by striking at their central or highest points, prevent the danger of decay around the edges of the enamel and fillings. The teeth rest upon each other at the original points of contact, and offer no impediment to the successful use of the brush, pick, or thread. Sometimes, where the large molar teeth are much decayed on the back sides, and are difficult to see and reach, it is best boldly to slant them down, so that the operation of filling becomes more like that of a cavity on the grinding surface; for, though the masticating surface of the tooth is lessened, the increased durability of the operation warrants it.

DENTAL LICENTATE DINNER.

ON the 18th instant, about sixty gentlemen dined at the Albion, to celebrate the establishment of the degree of Licentiate in Dental Surgery. The meeting, we are happy to say, was a great success. Mr. Rogers, the chairman, pointed out clearly the object of the degree—that it was to secure for the dental surgeon a mark of recognition, which would be accepted by the profession at large and by the public. We can assure the licentiates in dental surgery that they have our warmest sympathy; and that our profession cannot but rejoice to see this grand movement going on, which must eventually be the means of wholly rescuing dental victims from the illegitimate hands into which they too often, at present, unfortunately fall. The greatest credit is due to Mr. Rogers, and to those who have so warmly aided him, in this effort of placing dental surgery on a satisfactory footing. It is clearly necessary that a division should be made between the authorised and unauthorised *opifer* in dentistry.—*British Medical Journal*, March 30, 1861.

A TOOTHsome FEAST.

PURVEYORS of public dinners possibly reckon on and make allowance for a certain number of tender-toothed feeders at each feast, who “cannot eat but little meat” because of an *edax cura* (which eating care is caries), who cannot fall to “tooth and nail” because of an ail in a tooth. Any such calculations must have been sadly upset when the Licentiates in Dental Surgery very appropriately dined together last week to celebrate the first anniversary of the granting of their diploma by the College of Surgeons; for assuredly, if he “who rules o’er freemen should himself be free,” dentists by the same rule should have no difficulty in chewing what they choose, and should possess that essential to human comfort—the “*dens sana in corpore sano*.”

When the new degree of Licentiate in Dental Surgery was first instituted by the College of Surgeons, we pointed out the many advantages of such an affiliation to the medical profession, to the dentists, and to the public. Our anticipation that the most eminent members of the dental profession would recognise those advantages, and avail themselves of this opportunity to give higher position to the body they represent, has been fully realised. The dignity and reputation of the College of Surgeons is assurance sufficient that none but those who are worthy will pass its portals; and the eminence of the gentlemen selected to conduct the examinations in dental surgery affords further guarantee were it needed.

We note with satisfaction that this point (to which we only allude as a public duty) received no notice at the recent anniversary dinner of the licentiates admitted during the first year of the new College regulations. The speakers, including Mr. Rogers, Mr. Harrison, Mr. Tomes, and other eminent surgeon-dentists, pointedly referred to the advantages of this new and honorable recognition of dentistry as a branch of surgery, and told how it had taken the efforts of twenty long years to accomplish it; they pointed out how much the position of the dental surgeon must in future depend on the self-respect of the members of the profession; but not one word was offered in depreciation of that opposition to which we have more than once alluded. We trust that this cautious reticence on a

subject which might well have produced some ebullition of feeling, will lead to a settlement of the differences now existing in the dental profession, and to their making common cause against the uneducated advertising impostors, who chiefly owe their success in pilfering the public to the absolute ignorance which prevails as to there being any legal qualification by which a respectable dentist may be recognised.—*Lancet*, March 23, 1861.

To Correspondents.

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1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.
2. All communications relative to subscriptions and advertisements are to be addressed to the Publisher, Mr. John Churchill, 11, New Burlington Street, London, W.

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British Journal of Dental Science.

No. 59.

LONDON, MAY, 1861.

VOL. IV.

Dental Surgery and Medicine.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

(From 'The Dental Cosmos,' October, 1860.)

(Concluded from page 89.)

WHEN the constitutional cause of caries is obscure, a diagnosis should be made, just as in that of any obscure medical disease. First, the general condition of the system might be considered. Is it sthenic or asthenic? Is it working above or below the proper level? Have we a pulse depressed or continuously exalted? Is it quick and strong, or quick and weak? Then, have we acute or chronic anæmia? Have we scrofulous, scorbutic, or carcinomatous cachexia? Have we nervous, bilious, sanguine, or lymphatic temperament? or have we combinations of these temperaments? Then what disease is common to such conditions? and is there any disease therewith connected by which we may discover a relation, direct or collateral, with the well-being of the teeth? And so on, until we get our diagnosis.

He considered at some length the subject of anæmia, showing the effect of such condition on the general health, and particularly on the health of the teeth; gave, in example, several cases where he had arrested the decay of the teeth, through such constitutional medication as seemed indicated, and where, before such treatment, operations on the teeth were of very little service.

He desired to be understood in his former remarks, and did not advocate the dentist turning doctor or surgeon, as he would not have the inclination nor the opportunity

to gain the clinical experience, without which either of these pursuits could not be successfully practised; but the dentist should be as well grounded in the principles of medicine as either of them. While inclining himself rather to a surgical than a dental practice, yet no man could have a higher regard for dentistry; and should ever advocate the same education for the dentist as for the physician. The dentist to commence the mechanism of his profession only after completing the curriculum of the physician. The object of the professional man should be the greatest good of him he serves; and nothing should be left undone which would assist him in rendering such service.

Dr. McQUILLLEN said, the valuable specimens presented by Dr. Barker, illustrating the effects of citric-acid upon the teeth, recalled to his mind the case of three sisters who had come under his notice, in which nearly all the teeth were lost prior to their twentieth year. That this result could not be attributed to defective formation, was proved by the fact that each of them had always enjoyed perfect health, and that their father, mother, and brothers possessed excellent teeth. In the course of his inquiries relative to the cause of this early loss, he had been informed by them that during their school-girl days they were very fond of, and expended a large part of their pocket-money in purchasing, lemons, which they used to eat. This explanation was sufficient to account for the existing state of things, for such a practice could not be pursued for a considerable period without being followed by the most disastrous effects upon the teeth.

At a former meeting of the association he had taken occasion to advance the view, that in certain conditions of the organism an excess of lactic acid is formed in the system, and that its elimination by the salivary glands was calculated to exert a deleterious effect upon the teeth. In support of this, the attention of the members was also directed to a tooth which had been lying in lactic acid for nearly a year. It was found reduced almost to a cartilaginous mass.

In response to a remark with regard to uric acid, he said that it appeared reasonable to infer that in the uric-acid or gouty diathesis there is more than enough of the acid present to saturate the various salts found in the different fluids of the body, to form the urates of soda and lime, which constitute the chalk-stones found about the joints; and that the excess must be excreted by the different glands, the salivary no doubt coming in for their share. If, then, uric acid should be present in the saliva, it certainly could not be regarded as an altogether unwarrantable hypothesis to suppose that the same reaction would take place between it and the mineral constituents of the teeth, which is universally admitted to occur between uric acid and the phosphates and carbonates of lime and soda in the other fluids of the organism.

Dr. FITCH agreed with Dr. Garretson that mercury had little, if any, direct effect upon the teeth; its marked influence was upon the glands and the mucous surfaces. In cases of ptyalism, fearful results upon the dental structures were in a great measure attributable to subsequent carelessness or injudicious treatment. Some twelve years since, saw a case of mercurial sore mouth, where it was followed by the loss of the bicusps and molars of the inferior jaw, together with a considerable portion of the contiguous maxilla. Was called to the case in its advanced stages. Thought at the time, and still thinks, that these sad results were due to the causes just mentioned, rather than to any direct effects of mercury.

It was possible for many depraved conditions of body, or cachexia, to show themselves remotely upon the teeth; but in the case of diabetes, instanced by Dr. Garretson, he doubted the position assumed. Had seen several such cases where death ensued, but the teeth remained unaffected. Thought that protracted organic or functional disease might affect the teeth, so far

as nutrition and the vital forces were concerned, but no further.

Dr. GARRETSON said, no more marked or interesting example of a constitutional deterioration in the saliva can be given than that induced by the hydrophobic condition—a vitiation induced in this secretion alone. In *rabies canina* this is the only poisoned principle, at least so far as the ability to inoculate is concerned. A post-mortem examination of the human species, and also inferior animals, after death from this disease, exhibits no pathological condition outside of the vitiation alluded to, if we may except the occasional inflamed condition of the mucous membrane, particularly those portions associated with the larynx, pharynx, and the orifices of the stomach.

The milk of a cow bitten by a rabid dog has been used during the whole period of incubation of the disease, even to the very day at which rabies exhibited itself; yet such milk had no influence in propagating the affection. There are on record many cases in which infants have been fed on the milk of goats during the incubative period, while no bad results have occurred.

That the poisonous principle is eliminated alone in the salivary secretion is proven by our everyday observation of cases. Thus, a bitten dog seldom escapes; while in man the proportion escaping is as fifteen to one attacked (*Colles*). The explanation seems plain; in biting a man, the saliva is wiped from the teeth of the rabid animal as they pass through the clothing. When a man is bitten directly on the unprotected flesh, his chance of escape becomes very much lessened. Thus, the Duke of Richmond lost his life while in Canada by being bitten on the thumb by a tame fox. Taylor mentions the case of a Mrs. Duff, who died from hydrophobia through inoculation from a poodle dog which she was in the habit of allowing to lick her face, the poisoned saliva being absorbed through an abraded surface. He remarked that the example was interesting to the dentist, inasmuch as it seemed to prove that from other causes certain pathological conditions might exist, a peculiarity of which should be the influence on the teeth while on the outside of the secretion itself.

ALVEOLAR ABSCESS—TREATMENT AND CURE.

By W. H. SHADOAN.

(From 'The Dental Register of the West,'
April, 1861.)

THE successful treatment of an alveolar abscess has, by many, been considered one of the impossible things; but the many experiments by scientific dentists show that to be erroneous. I do not say that all abscesses can be cured, but I do say that many, if properly treated, can; and when I make this assertion, I do so from personal experience in a practice of about five years, which gives me the satisfaction of knowing to a certainty that alveolar abscess may be cured. How was it a few years ago with the teeth when a gum boil was occasioned by a tooth? The first thing was to say, "Oh, that tooth can't be cured, it's gone too far;" if you would have saved the tooth you should have come before the "gum boil" made its appearance, and had the tooth plugged.

Well, now, that all of our patients do not know what to do, or what they can do; we must take them as we find them, and, if possible, save them. I remember that in a conversation with a Dr. D., of Kentucky, a few months ago, the subject of diseased nerves of the teeth and alveolar abscesses came up, and he emphatically said, that the successful treatment of either was a humbug, and that he did not believe it could be done. He said that as a proof of the assertion, that one of Dr. Watt's brag jobs of "fang-filling" came to him a short time before, and that he undertook to treat it and had failed, and that he never did have success in any case, however simple. Now in fang-filling, when there is alveolar abscess—we don't pretend to say we can save all cases, but we do most positively say that we can cure most cases if they are presented before the disease runs too long. For a physician to say that he can cure all his patients, under any and all circumstances, is the best proof that he is a quack and wishes to deceive.

The subject of treating alveolar abscess is not the subject of so much thought and consideration in our Dental Associations as it should be, nor is it written on so much as other subjects, perhaps of less interest than it: therefore I would suggest that some of our professional brethren

should devote a portion of their time to that of the different diseases of the processes, and say less about Dental Ethics, &c. I have no fault to find with their writings, but would like to see other subjects properly attended to.

As to the causes of alveolar abscess, I presume the profession is familiar, it being produced in most cases by acute inflammation of the dental periosteum; sometimes caused by dead teeth, or the suppuration of the lining membrane of the pulp, or from an accumulation of purulent matter at the extremity of the tooth, the egress of which has been prevented by the natural opening being closed up. Or it may be caused by mechanical violence or some other irritating cause.

We have in a very brief manner glanced at the causes, &c., of the disease. I will now notice some of the results, with the most popular treatment, and more especially that which I adopt in my own practice, giving at the same time a few cases showing the result. I shall give the most aggravated cases in my practice, so that you may see the success.

The final result of alveolar abscess is so well known at this day, that the time will be best spent by passing to the treatment at once. My practice was, when I first began the treatment of such cases, to use nitrate silver and creasote principally, sometimes adding a little tannin and sulphate copper. The treatment which I now adopt is chloride zinc, as a disinfectant; after which I use creasote, sometimes tinct. myrrh, sulphate copper, sulphate zinc, nitrate silver, and sugar of lead, &c., &c. My principal remedy is the first two.

I will now give a few cases to show the success I met with.

CASE 1. J. H. D. B., *æt.* 36.—Sanguine bilious, of sedentary habit, called to have some teeth filled, one of which had, as he said a "gum boil on it." After filling all but the one to be treated, I examined it and found that the cavity of decay did not extend to the pulp cavity; I filled the cavity and treated the tooth externally: the tooth in question was the right superior first molar. Treatment:—drilled a hole into the apex of the labial anterior fang from which the pus proceeded. Treated with nitrate silver and creasote, May 17, 1858.

May 19.—Treated as before; patient doing well.

May 21.—Patient doing very well;

abscess nearly well. Directed him to use some slight purgative. In a few days he called again, perfectly cured.

CASE 2. April 8, 1859. S. V. C., æt. 18.—Case of disease of the fang of the left lateral incisor, which had first the appearance of periostitis, which resulted in an abscess; formed an opening through the canal, and treated as in Case 1, adding Teft's Anæsthetic. Cured in six days.

CASE 3. June 18, 1860. C. C. R.—Abscess of the anterior fang of the first right inferior molar. The pus escaped at the margin of the gum, about the centre of the tooth. Dr. —, of Bloomington, Indiana, had filled the tooth with amalgam four years ago, when it caused so much trouble that the filling was taken out. After that another celebrated D.D.S. of the said B., tried his hand on the tooth, and to better the case he filled with tin. The tooth came to me on June 18th; I drilled down into the cavity as far as I could (the cavity taking a turn which prevented the successful drilling of it). I treated for several days with chloride of zinc and creasote alternately. I could cure the tooth and abscess as far as I could reach, but could not reach the seat of the disease. If the patient had not left, I should have continued the treatment, endeavouring to reach the seat, if possible. This I consider a failure for want of time.

CASE 4. Mrs. R. G. called January 16, 1861.—Abscess formed at apex of fangs of first superior molar, right side: tooth filled with tin ten years ago. Removed filling, and drilled through into pulp cavity, some pus discharged, then drilled through the fangs into process, found the pus in quite a quantity. Syringed the cavity

with warm water, then with a solution of chloride of zinc, and saturated small pledget of cotton with creasote, stopped up the pulp cavity and ordered a cathartic.

January 17.—Patient called, doing reasonably well; soreness partially relieved, bowels in a good condition.

January 18, 9 a.m.—Patient doing well, rested easy since 3 a.m., soreness all out of the tooth, the discharge ceased.

January 19, 9 a.m.—Syringed tooth with warm water, treated with zinc and creasote as before. From all indications the cure is effected, there being no soreness or discharge.

January 21, 9 a.m.—Removed the cotton and found the tooth well; there is no soreness or any sign of disease.

January 23, 9 a.m.—Cleaned tooth as well as I could, then saturated a small pledget of cotton for each fang, and placed them in the bottom of cavity, and filled fangs with gold.

January 31, 9 a.m.—Patient called that I might know how case is doing; all well, no trouble whatever.

February 6.—Tooth still doing well, and since then has been no trouble; it is presumable there will be no return. Filled crown cavity with J. B. Dunlevy's gold-foil.

February 13.—Patient called that I might know how case is doing. A little soreness once for an hour or so, on the 10th. No indications of a recurrence since.

March 7.—Case 4 doing well, patient well pleased with the success. Thinks the price of such a job rather high for one tooth, but don't complain.

Chemical Department.

PRACTICAL HINTS ON ELECTRICITY IN RELATION TO ELECTRO-PHYSIOLOGICAL APPARATUS. By J. N. HEARDER, Electrician, Plymouth.

(Continued from page 93.)

ON THE SECONDARY OR MAGNETO-ELECTRIC CURRENT, AND THE COIL MACHINE.

WHEN an iron core surrounded by a coil of copper wire changes its magnetic condi-

tion, either from the normal to the magnetic state or *vice versa*, a transient wave or current of electricity takes place in the coil, the intensity of which depends upon the instantaneous character of the change, the degree of magnetic excitation, and the length of the coil. If an arrangement of this kind be surrounded by a second coil of copper wire, then extra and secondary currents, such as are observed in the first coil, will

also be observed in the second; and this is the principle of the coil machine. The action of this instrument results purely from the development of an electric wave during the return of the magnetized core to its neutral condition.

The forms of this instrument are as varied as the notions of the individuals who contrived them. Few appear to be guided by any sound scientific principles in the determination of the relationship of the size and length of the coils to the battery power; hence some machines are furnished with batteries consisting of several alternations of large plates, whilst others require only a single pair of small dimensions to obtain the same results. The principal parts of the machine are five, viz.—

1st, a primary coil to conduct the current of the battery.

2d. A soft iron core to take up, concentrate, and radiate the magnetism produced by this current.

3d. A contrivance for rendering the current intermittent.

4th. A secondary coil to develop and multiply the action of the secondary induced current; and

5th. A means of regulating these currents or waves. These various parts it may be well to consider separately.

(1) The primary coil.—The size and length of this coil must be determined entirely by the nature of the battery to be employed. If the battery consist of a single plate, it is necessary that the resistance of the primary coil should be proportioned to it; and since it is an established law, that the resistance of wires are directly as their length, and inversely as their thickness, it follows that the less the electro-motive force of the battery, the shorter and thicker the coil should be. If, on the other hand, an intensity battery, consisting of a number of alternations, be used, then it will be necessary to employ a longer primary wire to develop its full power. In any case, the relation of the battery to the wire should be such as to ensure the greatest amount of magnetic intensity in the iron core.

(2) The iron core.—It has been found by experience that a bundle of iron wires will take up and part with magnetism much more readily than a solid iron core of equal dimensions, hence it is usually employed in preference; but there is another and much more important objection to the use of the solid core, which will be noticed presently.

In the determination of the size of this core, due regard should be paid to the

quantity of magnetic action likely to be produced. From the author's experience, it would appear that the best effects are produced from a core of moderate size, highly excited.

(3) The interruptor.—The object of this portion of the apparatus is to produce the magnetic changes which give rise to the electrical waves in the secondary wire. In most cases, this object is attained by constructing a portion of the primary circuit of a spring, which, by its elasticity, maintains contact with another portion of the current, and thus ensures continuity. The circuit is broken by attaching to the end of this spring a piece of soft iron, which, by being placed either over the end of the iron core of the apparatus, or over the poles of a separate electro-magnet placed for this purpose, becomes attracted whenever the voltaic current passes, and thus separates the spring from the portion of the current with which it was in contact. The voltaic current is thus momentarily interrupted, and all the magnetic effects suddenly cease. The spring, being now liberated from the attractive influence of the magnet, returns by its own elasticity to its original position, and thus restores contact; the current again flows, excites magnetism in the core, which instantly attracts the spring and breaks contact again, giving rise to the same phenomena as before. Thus a rapid succession of impulses may be produced, depending upon the form of the spring, amounting even to 200 to 300 vibrations in a second. Sometimes these interruptions are produced by causing a toothed wheel, turned by a handle, to form part of the circuit, a spring acting upon the teeth, interrupting the circuit as each tooth touches and leaves it in succession.

(4) The secondary coil.—When the core is magnetized by the passage of the current through the primary coil, as has been already described, it reacts and induces an extra current in the opposite direction through the coil by which it is surrounded. This inductive action takes place not only upon the primary coil, but upon the secondary coil as well. It is found, however, that the induced current thus excited, having the choice of two circuits, will choose the one which affords it the least resistance, and thus the primary coil, when in contact with the battery, forming a closed circuit of small resistance, nearly the whole of the induced current circulates in it, a very insignificant portion being discoverable in the secondary wire. When

the connexion with the battery is broken, the primary circuit is opened; consequently the induced current developed by the return of the iron to its normal condition, and which is more sudden than that produced by its more gradual magnetization, acts upon both the primary and secondary circuit, and develops a current in each, the intensity of which will depend upon the number of coils upon which the inductive section is exerting its force. The major portion of the induced current traverses the primary wire, and establishes its own circuit in the form of a spark at the points of disruption; the remainder circulates in the secondary wire, the number of coils of which multiply its intensity to an astonishing degree—so much, indeed, as to enable it to leap across a small interval of wire, when the terminals of the secondary wire are brought very near to each other. The author was the first who exhibited this phenomenon, about thirty years since. The direction of this secondary current is, as already described, coincident with that of the battery current in the primary wire before breaking contact.

That much of the secondary current circulates in the primary coil may be proved, by connecting with the two ends of it, where the current is interrupted, the two coatings of a Leyden jar, or any adequate analogous arrangement, which will thus interrupt the completion of the circuit in the primary wire, and concentrate more of the effect on the secondary wire.

Rhumkorff, in extending this principle, succeeded in obtaining sparks between the terminals of the secondary coil, half an inch in length; and the author, without knowing anything of Rhumkorff's arrangement, carried out an entirely new system of insulation, by which he succeeded, with a very small machine, in getting sparks of an inch in length, and very soon after, in a larger machine, sparks three and four inches in length, thus originating an entirely new form of apparatus, the principle of which has been since adopted by various philosophical-instrument makers, who have been very successful in producing instruments of extraordinary power. These improvements were honoured with the first silver medal of the Royal Cornwall Polytechnic Society, in September, 1856. (See 'Phil. Mag.,' for Nov. and Dec., 1856, and May, 1857, and 'Society of Arts Journal,' February, 1857.)

(5) The regulator.—In employing the secondary current thus produced, for physiological or therapeutic purposes, it be-

comes necessary to modify its force to suit circumstances, and this object is attained in various ways. One mode is to make the iron core moveable, so as to withdraw it partially or wholly from the centre of the coil, and thus reduce its inductive action, and thereby lessen the amount of electrical effect in the secondary coil. Another mode is to insert in the circuit a bad conducting substance, such as a tube of water, and modify the effect of the current by thrusting a wire into this water, so as to include a greater or less length of it in the conducting circuit. A third plan is to make the core small enough to allow a brass ferrule to be slid over it; and the effect of this is to lessen the secondary current in proportion to the length of the iron core covered by the ferrule. The tube acts the part of a short, closed circuit; and the secondary induced current circulates round this tube, in preference to either the primary or secondary coil. It is upon this principle that a solid iron core is objectionable, since the electric current which itself induces circulates in a great measure round its own periphery. A fourth plan, and which the author prefers, is to divide the secondary coil into equal parts, any number of which may be included in the circuit, thus constituting equal and known increments of force; the delicacy and accuracy of this arrangement he still increases, by setting apart one of these portions of the coil, which he again subdivides into four parts, which are so contrived that they can be added in succession to any of the other degrees, so as to render the advance more gradual.

It has been objected to the use of the coil machine, that it furnishes a to-and-fro current; and since it has been determined by physiologists that a current through a nerve may be beneficial in one direction, and prejudicial in another, the benefit of these machines has been considered to be questionable.

It is quite true that a wave in one direction is produced during the magnetization of the iron core, by the current of the battery, and a wave in the opposite direction on breaking contact and demagnetizing the iron; but the author has found that, by reducing the resistance of the primary wire and the size of the battery to the minimum, so effective a closed circuit is produced when the battery current passes, that nearly the whole of the extra current circulates in it, leaving so little to circulate in the secondary wire that its effect

is scarcely appreciable, even by delicate chemical reagents, and the secondary current may thus, so far as all practical purposes are concerned, be looked upon as acting in one direction only.

In machines in which the primary coil is long and slender, and is excited by intensity batteries, he finds that the reverse extra current is so considerable as to be quite open to the objection just mentioned.

The author believes that the minute and definite subdivision of the power of the secondary current, which he has himself introduced, is the best adapted for electro-dental and, indeed, all physiological purposes.

(To be continued.)

ON DEATH FROM CHLOROFORM.

(From the 'Medical Times and Gazette,'
May 4th, 1861.)

At the Western Medical and Surgical Society, Friday, April 19th, 1861, Dr. Sansom read a paper, "On Death from Chloroform." The author considered that, at the highest estimate, the number of deaths from chloroform to the number of inhalations bore the proportion of one to ten thousand. Various considerations, however, concurred to show that this should be very much more favorable. In the first place, it was very probable that several of the deaths were from shock or fright, and not from chloroform; and in furtherance of this view was the fact that half of the number of deaths occurred before the commencement of the operation for which chloroform was administered. Another avoidable circumstance increasing the death rate was supposed to be carelessness and laxity in the administration of the vapour. Circumstantial records of thirty-four cases of death which have occurred since the publication of Dr. Snow's work were presented: the author combined them with those recorded in that volume and offered an analysis of their most salient points. In cases of death the proportion of males and females is about two to one, and this seemed to the

author strange, since the anæsthetic is so largely used in midwifery. The average age for death is thirty to forty. It certainly seems that the strong and healthy stand a worse chance than the debilitated; but of all states of the system chronic or acute, alcoholism the most predisposes to death. Extensive disease of the lung occasionally disposes to death from asphyxia; disease of the heart probably does not influence the mortality. Dr. Sansom strongly deprecated the administration of chloroform sprinkled on handkerchiefs, &c., basing this not only on the observed fact that a highly-charged atmosphere (5 per cent. Snow, 8 per cent. Lallemand, Perrin, and Duroy) was fatal to animals, but on the circumstance that of all the cases which he had collected, only two were mentioned as occurring wherein a proper inhaler had been used. Of fifty-one cases, thirty-eight declared their danger by sudden stoppage of the pulse. Five deaths occurred in which there was manifested great muscular excitement, collapse immediately following: these were all strong men in their prime. Sudden vomiting and then death, occurred twice: congestion of the face was the most marked sign in six, and cessation of breathing in eight cases. Dr. Sansom considered that death occurs both by asphyxia and by syncope—in animals by palsy of respiration, the heart being "ultimum moriens;" in man occasionally from this cause, but more frequently from palsy of the heart, the respiration outliving it. In animals a constant sign on post-mortem examination is distension of the right chambers of the heart; in man this is a frequent, but still far from a constant sign. Fluidity of the blood and a dark colour thereof occurs almost invariably. The following were the author's conclusions:—In animals, death occurs by asphyxia, and begins in the brain. In man, death occurs by asphyxia or syncope, and begins in the brain, in the heart, or in the lungs. Artificial respiration is the only reliable means for restoration in critical cases. Galvanism of the phrenic is valuable where the means are at hand. Before anything is done, the tongue should be well drawn forward, and the mouth and throat cleared from mucus.

Hospital Reports and Case-Book.

OPERATIONS UPON THE MOUTH AND THROAT.

(From 'The Lancet,' May 4th, 1861.)

(KING'S COLLEGE HOSPITAL. Under the care of
Mr. FERGUSSON.)

ON the 20th ult., a young man entered the theatre, with a fissure extending through the soft palate and a small portion of the hard palate. Staphyloraphy was performed with complete success. There was at first a little more sensitiveness of the parts than is usually witnessed in these deformities, but it soon passed away, and the operation was readily completed. We recollect the case of a girl upon whom staphyloraphy was performed by Mr. Fergusson, on the 1st December last, for cleft palate. She had previously been operated upon for hare-lip. On the occasion now referred to, however, she evinced astonishing moral and physical courage, for during the entire time she scarcely stirred; and the operation was finished in the most satisfactory manner, and a cure resulted. This was the ninetyeth case of staphyloraphy performed by Mr.

Fergusson, and, out of that large number, three only proved unsuccessful, as we heard him state in January; and that was not the fault of the operation itself.

Another case was that of a boy, aged ten years, in whom there was loss of substance of the left side of the lower lip near the angle, with adhesion of the lip to the gums and exposure of the gums and teeth, the result of a former attack of cancrum oris. The deformity was not only unsightly, but gave rise to more or less constant slobbering. It was remedied by a sort of plastic operation, which consisted in the paring off the edges of the cicatrized part, loosening the adhesions between the chin and gums, and making an incision through the left part of the chin to relieve any traction, as well as to permit of the elevation of the left lower lip. The semicircular wound thus made was closed with hare-lip pins. If nothing occur to prevent union of the parts, the deformity will be much lessened, and the inconvenience of slobbering wholly obviated. This operation was done under the influence of chloroform.

British Journal of Dental Science.

LONDON, MAY, 1861.

THE habit of striking a balance from time to time is observed by all good economists. The loss and gain, and the contingent liabilities are carefully noted, and the future prospects calculated. When pecuniary transactions form the subject for consideration, the summing up is a necessary and, when proper precautions have been observed, an easy process. But when the progress of knowledge, of opinion, or of social or professional status form the items of the account, the calculation does not yield the same definite results. Still an

approximate estimate may be made, capable of correcting past errors, and of affording a guide for future proceedings. The division of dental practitioners into two distinct parties at the onset of the present educational movement, proceeded rather from a misconception of the objects each party had in view, than from any well-marked difference of opinion. This fact meeting with mutual recognition, an earnest attempt was made to amalgamate the two parties by a fusion of the Odontological Society and the College of Dentists into

one compact body. The attempt failed, solely from the bad faith of a turbulent minority, who, with a certain aptitude for electioneering manœuvres, threw out the question upon a matter of form. A large number of the more eminent members, disgusted with the proceeding, seceded from the College of Dentists, and subsequently joined the Odontological Society. We fully believe that, up to that time, the leading members of the College of Dentists had the welfare of the dental profession at heart; but with the secession the spirit passed away. Since that time, the evidence of deeds goes to show that this College is but a mere clique, struggling for a prominent position. The laws have been altered; persons are now admitted who were previously excluded, the proper professional term has been sacrificed, and the system of public advertising has received a practical encouragement, by the admittance to the membership of advertising dentists. The Odontological Society has consistently adhered to the principles upon which it was established, and steadily increased in numbers and in influence; while the College, acting only on expediency, has gradually lost both members and prestige; and, but for the unwarrantable scheme of issuing an unauthorised diploma (acceptable to those who could obtain no other), it would ere this have smouldered out. Still, through its organ, the 'Dental Review,' it boasts of its position, its influence, and its principles; and in a late number of that journal, it felicitates itself upon two dental appointments, regarding them as acknowledgments by public institutions of the value of its diploma of membership. The governors of the Colchester Hospital, no doubt, in appointing Mr. Tweed, accepted the services of the best man they could find; but in commenting upon the appointment, it should have been stated, that Colchester does not furnish a dentist holding a recognised diploma, and had the governors of the hospital objected to Mr. Tweed, the objection must have been grounded upon the fact, that he holds the College of

Dentists' diploma. An announcement of the alleged dental appointment at Fort Pitt, Chatham, we have failed to discover in the 'London Gazette,' where all appointments to military institutions, ranging above the grade of those held by non-commissioned officers are made public, and the suspicion that no such appointment had been made, is fully justified by information we have received, the correctness of which does not admit of doubt.

The eagerness with which the College of Dentists strives to obtain a recognition from public medical institutions, is sufficiently shown in the controversy which raged in the Southampton papers respecting the appointment of a dental surgeon to the South Hants Infirmary, and had the statements made in behalf of the College of Dentists been consonant with the facts of the case, no blame would have attached itself to the College or its adherents. But the exposed attempt to traduce the College of Surgeons, and the unprovoked attack made upon its Board of Examiners in Dental Surgery, cannot have failed to open the eyes of those who were sufficiently interested to read the various letters which appeared upon the subject.

The good opinion of those it most concerns is necessary to the stability of a public institution; and, in a professional question, the public is eventually governed by the opinions of professional men. In respect to the College of Dentists, we have, even at this early date, an opportunity of learning the opinion of those dentists who hold hospital appointments, by the course they have individually taken with reference to the dental diploma of the College of Surgeons and that of the College of Dentists. We may, on this point, add up our sum, and count the amount of progress in the subjoined table, to the perusal of which we beg to direct the attention of our readers.

To the evidence afforded by this table great value is attached. Dental surgeons, of recognised hospitals and schools, are closely associated with medical practitioners and teachers, and have frequent opportunities

of hearing the opinion of their colleagues upon questions connected with education; and being themselves engaged to a greater or less degree in teaching their own subjects, they have, individually, pre-eminent opportunities of forming a correct estimate, not only of the educational requirements of dental practitioners, but of the means best calculated to ensure professional competency. Any system of education which does not engage the good opinion of a body of men holding this vantage-ground for observation offers but little hope for those students who are subjected to its influence. And the almost unanimity with which the principles set forth by the Odontological Society are advocated by those dentists who hold prominent public appointments is a practical condemnation of the neglect of systematic studies adopted by the College of Dentists. The statement that the University of London requires of its candidates for examination no prescribed course of study is like many other statements which have emanated from the College of Dentists; it is both true and false. When the examination is of a purely literary character, the applicant may gain his knowledge how and where he can. But the medical student is required to produce testimony of having studied practically the various subjects upon which he is to be examined. He must have attended certain courses of lectures, and observed for himself the treatment of cases in the wards of a recognised hospital. These regulations were framed, after a mature consideration of the whole bearings of the case, by men whose tendencies were altogether in the liberal direction. The effect of allowing students to attend what lectures they thought fit was fully tested in past times, when certificates of attendance were freely given by lecturers to pupils who had entered to the prescribed courses, but whose presence in the lecture-room was of rare occurrence. If medical men were, as a body, better educated fifty or sixty years since, when the attendance to a defined course of studies was a mere form, than they are at the pre-

sent day, under a strictly enforced curriculum of education, the authorities of the College of Dentists may contend with some show of reason for the suppression of the present system of instruction. If, as we suspect, the writers in the 'Dental Review' have formed their opinion from experience gained during the first two sessions of a dental school, before forced and exceptional have given way to normal conditions, or from observations made at a small medical school, their conclusion cannot be accepted as important evidence in favour of a system which general experience condemns. The strong feeling entertained by medical men in favour of a systematic education was strongly shown in the protests which appeared upon the alleged admission, after examination, to the membership of the College of Surgeons of persons who, though many years in extensive practice, had not conformed to the usual course of medical education.

The institution of lectureships upon medical subjects is a clear proof that the managers of the College of Dentists regard the acquisition of medical knowledge as necessary to the duly qualified dentist; but the lectures are to be attended or not, at the discretion of the student. If it is desirable that the learner should have the advantage of attending lectures, and receiving practical instruction under recognised teachers, why not act fairly by the profession, and frame regulations to that effect? We see but one answer to the question. It would not serve the purpose of the College of Dentists to act consistently with the convictions of its more intelligent members. We can fancy the authorities of this College saying, "We are a dignified and a noble institution. We think dentists should be educated; but we receive all comers, and leave the matter, both of general and special education, quite in their hands. We stand with open arms, beckoning all who will favour us with but a glance. We ask no unpleasant questions about either professional conduct or acquirements."

That the public necessities require the services of a large body of well-educated and skilful dental surgeons does not admit of question. Whether the proceedings of the College of Surgeons or of the College of Dentists are, best calculated to supply

that demand, we will leave our readers to determine. We have done our best, from time to time, to bring together the items of the account, and will leave them to cast up the balance.

RECOGNISED LONDON HOSPITALS, AND THE SPECIAL QUALIFICATIONS OF THE DENTAL OFFICERS.

Names of Hospitals.		Licen. in Den. Sur.	Mem. Odont. Soc.
<i>St. Bartholomew's</i> {	ARNOLD ROGERS, Esq.		Ditto.
	S. T. TRACEY, Esq.		Ditto.
<i>Guy's</i> {	THOMAS BELL, Esq.	Ditto	Ditto.
	JAMES SALTER, Esq.	Ditto	Ditto.
<i>St. George's</i> {	CHARLES VASEY, Esq.	Ditto	Ditto.
	JOHN LEE STATHAM, Esq.	Ditto	Ditto.
<i>Great Northern</i> {	CHARLES JAMES FOX, Esq.	Ditto	Ditto.
	H. J. BARRETT, Esq.	Ditto	Ditto.
<i>London</i> {	SAMUEL CARTWRIGHT, jun., Esq.	Ditto	Ditto.
<i>King's</i> {	ALFRED COLEMAN, Esq.	Ditto	Ditto.
<i>Metropolitan Free</i> {	JOHN TOMES, Esq.	Ditto	Ditto.
<i>Middlesex</i> {	EDWIN SERCOMBE, Esq.	Ditto	Ditto.
<i>St. Mary's</i> {	J. W. ELLIOTT, Esq.	Ditto	Ditto.
<i>St. Thomas's</i> {	G. A. IBBETSON, Esq.	Ditto	Ditto.
<i>University College</i> {	— ROBERTS, Esq.		
<i>Charing Cross</i> {	C. CLENDON, Esq.		
<i>Westminster</i> {	J. ROBINSON, Esq.		
<i>Royal Free</i> {		Mem. Coll. Dentists.	

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

To the Editor of the 'British Journal of Dental Science.'

SIR,—At the last meeting of the Odontological Society, a report of which appears in your number for April, some remarks were made, to which, having thrown down the gauntlet, it may be expected I shall reply. I will therefore do so, and as briefly as possible.

The views I have advanced are in direct opposition to those which attribute decay, both in its origin and progress, to the effect of acids produced from decomposing food, and retained in the saliva and other fluids *external* to and *independent* of the teeth themselves; and all the results of my experience in the investigation, which has extended over a long series of years, tend to a confirmation of their affording the only satisfactory explanation of facts and appearances presented by the decaying teeth *in situ*. The latter views present so many discrepancies, that it is somewhat surprising any

theory so based should have been even received at all, much more should have retained its hold for some years without being refuted.

Mr. Coleman, in the early part of his paper, says he "was somewhat surprised to find so little evidence of acid fluids in the mouths of many persons whose teeth presented the conditions of rapid decay;" and after admitting that the saliva has never presented a sufficiently acid character of itself to account for the rapid disorganization going on in the tooth, proceeds to attribute the mischief to "a change going on in the food whilst in the mouth, through the agency of the saliva, and especially in those portions which are detained there by lodgment between the teeth, or in fissures in the enamel, communicating molecular disturbance to those portions of a tooth which have had their vitality lowered," &c.

Now the change here spoken of either leads to the development of an acid, or it does not. If it does, it is only the old tale

over again. If it do not, it affords no clue whatever to the source of the acid found in decaying dentine.

With regard to the experiments, nothing could be more fallacious. After admitting the hard substance beneath softened dentine to be strongly acid, the only precaution used seems to have been to remove the carious and softened dentine, "leaving only the hard dentine exposed." Thus, as those teeth so experimented upon had already undergone the principal changes peculiar to decay, and the remaining dentine being impregnated, more or less according to its density, with that which would act as a ferment capable of providing the means for its further destruction under the peculiar conditions resorted to, any deductions made from such imperfect data must of necessity be entirely without value. They tend, however, to prove this much, that the *external* acidity has little effect in producing the softening.

The remarks of our late president are somewhat more to the point. Mr. Harrison intended to ask me, had I been present, on what ground I so confidently spoke of one acid only, and stated it to be lactic acid. After bringing forward the well-known fact, that *moist* animal membrane, *in a slightly decaying condition*, often acts energetically in developing lactic acid, and showing that in the early stage of decaying dentine, before any acid effect presented itself, we have a membrane assuming that condition and all the other requisites for the production of this acid, and then find an acid becoming developed answering to it in its effects, the precise nature of that acid being so wholly unimportant to this portion of the investigation, it was deemed sufficient simply to show the source and mode of production of the *acidity* arising in softened dentine.

Mr. Coleman is perfectly right when he says, that in the formation of lactic, butyric, and other analogous acids, by the action of decomposing animal tissue on saccharine fluids, "the results are so uncertain, that you may make the experiment several times and obtain different acids;" and, respecting these different compounds, it has never yet been satisfactorily shown *that they really do exist in nature*. That they may be produced by certain processes from various substances is too well-established a fact to admit of dispute; but that they exist as such, *prior* to their becoming developed in the products of examination, is quite another affair. Considering that

all these hundreds of organic bodies consist of but three elements, carbon, hydrogen, and oxygen, combined in different proportions, and that the abstraction or addition of only a part of a proportion of any one of them leads to a different and separate body, as in the conversion of starch into sugar, sugar into alcohol, or acetic acid, or oxalic acid, it is not unreasonable to suppose that they are rather made by the chemist during the process of analysis; but, whether they exist or not, the question is, whether the acid or acids be produced from the food or the decaying dentine; my own views going to show that the decaying membrane is provided by the dead dentine, irrespective of stagnant food, as believed by Mr. Harrison. It is a beautiful idea upon which the latter theory is founded, but, unfortunately, it wants the connecting link between plausibility and possibility. It is not sufficient to say that decay is caused by acids acting externally. To establish such a theory, we must have, first, the demonstration of an acid being actually so produced; then, marks of this acid must be shown upon the surface of the enamel, or at the edges of the pits and fissures in which the stagnant food has lodged; for any acid capable of dissolving out the salts of lime from the dentine must of necessity also affect the enamel; and, until this can be shown to be the case, the chemical theory has nothing whatever substantial and capable of proof to recommend it.

The cause and effects of lateral pressure, I believe, are not clearly understood; but as my paper on that subject is about to reappear in the forthcoming volume of the Society's 'Transactions,' I will pass by this subject for the present. Respecting the death and decomposition of dentine, Mr. Harrison remarks that, "what we want to get at is, what *causes* the death which precedes this decomposition?" and adds, "I believe, sir, from my experience in surgery, that you could destroy the living tissue by a bread-and-water poultice, long enough applied." Herein, to my mind, lies the whole gist of the matter, and I hope, after such an acknowledgment of the truth of the commencing stage of what I have advanced, I shall obtain this gentleman's assent to the remainder, unless his own views can be more fully substantiated.

I am, Sir,

Yours, &c.,

W. K. BRIDGMAN.

69, St. Giles Street, Norwich.

To the Editor of the 'British Journal of Dental Science.'

SIR,—Believing it advisable to place all such cases as the following on record, and in the hope of inducing others to supply you with short notes of cases that occur in practice, I send you the following:

Mrs. —, on Feb. 8th, 1861, brought her infant boy, aged six weeks, to the Great Northern Hospital, King's Cross, with two lower central incisors appearing about one eighth of an inch above the gum. She stated that the child was born with them. He was a fine healthy child, but suffering from the action of the tongue upon the teeth

in sucking, the under surface being much abraded; the mother appeared to suffer no inconvenience in suckling from the presence of the teeth, which is easily accounted for, from the usual action of children at the breast. The teeth were thin, sharp, and loose, and, on removal, were found to be nearly deficient of roots. Previous to extraction, I took three impressions in wax and gutta-percha; the models, with the original teeth, will be placed in the museum of the Odontological Society, on June 3d.

I am, Sir,

Yours faithfully,

CHARLES JAMES FOX.

Dental News and Critical Reports.

THE ODONTOLOGICAL SOCIETY.

MONDAY EVENING, 6th May, 1861.

The PRESIDENT in the chair.

THE minutes of the last meeting having been read and confirmed,

The PRESIDENT made the usual announcement, with regard to newly-elected members who had not been formally admitted; and Mr. Frederick M. Rogers, Sackville Street, and Mr. George Laurie, Mortimer Street, Cavendish Square, came forward and went through the necessary form.

The following new members were elected: Resident, Henry Howard Hayward, Queen Anne Street, Cavendish Square. Non-resident: Robert Edward Stewart, 59, Bold Street, Liverpool. And Mr. Fisher, of Taunton, was proposed for election as a member.

The PRESIDENT.—I have no contributions to our library or museum to acknowledge, save a case of dilaceration (as Mr. Tomes has called it), presented to this society by Mr. Wheeler. I think it is a very interesting specimen. This is the only presentation we have this evening. There is a chair sent for inspection by Mr. Wells, of Regent-street,—an operating-chair. If gentlemen have any casual observations to make previously to our going into the discussion of Mr. Bridgman's paper, we shall be happy to hear them.

Mr. TOMES.—This being the time set apart for casual communications, I will mention a case which occurred during the latter part of last week. It was that of a female of about four-and-twenty. She described her symptoms very much in the following manner:—Two years and a half ago she was seized with an unpleasant feeling of tension at the back part of the lower jaw on each side of the mouth. The jaws gradually closed, so that after the lapse of a few months she could open the mouth only sufficiently wide to admit a very small teaspoon. From time to time she applied to a medical man, who told her that the lower wisdom teeth were gradually approaching the surface, and that he could feel them with a probe. He advised that she should patiently wait till they appeared through the surface of the gum. This state of things was allowed to go on for two years and a half. At the time I saw the patient, I found the teeth closed, and I could scarcely obtain a view of the back part of the mouth. The two second molars were decayed and useless. She complained of getting but little sleep, and of frequent attacks of pain in the temple, and pain in the neck, extending from the angle of the jaw down as far as the shoulder. The course of treatment was pretty obvious. Chloroform was administered, and the mouth was forcibly opened with an instrument (for which I

am indebted to Mr. Cattlin), a figure of which is given in a book published by myself some time since. The two second molars were then removed. On the following day I saw the patient, who stated that she was relieved by the operation, both from the feeling of tension and from the pain in the temple, that she had passed a comfortable night, and that the freedom of motion in the jaw was very much increased. She left town on the following day, and I have not had any opportunity of learning how the case progresses. It struck me that this case was worthy of the attention of the Society, as showing how a person may be condemned to suffering great pain and inconvenience, and loss of health, with no better motive in view than the retention of teeth which were obviously useless. To have attempted the removal of the wisdom teeth, which were deeply embedded in the gum, would in this patient, I think, have been a very difficult operation, and would probably have produced no better result than the removal of the two decayed anterior teeth.

Mr. COLEMAN.—A case of a similar kind, and arising from similar causes to that just described by Mr. Tomes, but which terminated in a far less fortunate manner, came under my notice rather more than a twelvemonth ago.

A gentleman in the medical profession, who had recently returned from India, with a constitution much impaired, was attacked with pain in the second molar tooth of the right side of the lower jaw, it was followed by considerable swelling, with inability to open the mouth; and after a time several abscesses pointed under the chin, and were opened, some also opened into the mouth, which at the time I first saw him, almost three months after he had first felt pain in the tooth, were fistulous openings, discharging a thin sanious pus, of a very offensive odour. The great tumefaction of the parts, together with the evidence of considerable necrosis of the jaw, rendered any attempt at forcible extension out of the question, and the necessity of laying open the cheek to afford the means of removing the offending teeth and dead bone was discussed by Mr. Laurence and Mr. Coote, under whose care the patient was. Before, however, so formidable a means was resorted to, I was desired by those gentlemen to see the patient, and if possible remove the tooth. The patient being placed under chloroform, an attempt was made to remove the tooth by a curved

elevator, which was not successful. The patient having stated previously, that he believed that the inner portion of the alveolar process of the jaw had exfoliated, the tooth was pushed inwards and into the mouth, from which it was, with considerable difficulty, removed; after this the wisdom tooth was removed with the elevator. The latter had, by its pressure between the coronoid process of the lower jaw and the second molar tooth, been the sole cause of the mischief, both teeth being perfectly sound. Some dead bone was also at the same time removed.

In a few weeks after the operation, the patient was in a very improved condition, being able to open his mouth, and had also gained flesh; but eventually malignant disease set in in the lower jaw, which carried him off about four or five months after the teeth were removed.

The case is interesting, as showing how the irritation caused by pressure of a tooth may be sufficient to set up in a vitiated constitution (and no doubt cancerous diathesis) malignant disease in the surrounding parts.

Mr. MUMFERY.—The case Mr. Tomes was referring to reminds me of one that occurred in my own practice, about two months since. A young lady from Berkshire, of fine, healthy constitution, and about two or three and twenty years of age, consulted me respecting her teeth, her mouth having been then closed about four weeks. The jaws could only be separated sufficiently to allow the introduction of a card between the incisor teeth. I first introduced a thin slip of wood between her teeth, and at the end of two hours I was enabled, by the successive introduction of slices of cork of gradually increasing thickness, to separate the teeth sufficiently to see the back of the mouth. The lower wisdom teeth had each of them one tubercle protruding from the gum, and the second molars on each side was diseased. I succeeded in drawing the lancet across the two wisdom teeth, and then gave the patient other slices of cork to take home, and in three days the mouth was sufficiently open for me to introduce the forceps and extract the second molars. I saw her on the following day, when she could open her mouth with very little effort, and I removed a portion of the thickened integument covering the wisdom teeth. On her last visit, about a fortnight since, she was enjoying perfect health. She had been in the state in which I saw her, at intervals, during a year and a half, and

her mouth had remained closed for a period of three weeks or a month at a time.

Mr. UNDERWOOD.—Perhaps, sir, Mr. Tomes will be good enough to tell us whether the mouth of his patient was suddenly or gradually opened by Mr. Cattlin's instrument.

Mr. TOMES.—It occupied only about two or three minutes to force open the mouth, the closure of which was not a consequence of thickening of the soft part, but of spasmodic action of the muscles of the jaws. After applying force for a minute or two, the muscles relaxed suddenly.

Mr. DEWE.—I take the opportunity, with regard to Mr. Tomes' remarks on the irritation produced by decayed molares in the lower maxilla, to mention a case brought to me by the late Mr. Bransby Cooper.

A tradesman in this neighbourhood had been very deaf indeed, for two or three years, with a foetid discharge from each ear, and extreme difficulty and pain in opening the mouth. After three or four hours' close application, the lower jaw was sufficiently depressed to obtain a view of the back teeth, and I was on the point of removing the anterior molar on the left side (which was slightly decayed), to which the patient attributed the pain on that side, when I discovered that the wisdom teeth had never been developed, although my patient was nearly thirty-three years of age. I made a careful examination of the parts, which were much inflamed, and succeeded in finding and removing the wisdom teeth. The discharge shortly ceased, and the hearing has been recovered. I mention this as a proof that the *dentes sapientiae* are sometimes the cause of much pain and inconvenience, which are attributed to other teeth.

Mr. CATTLIN.—I wish to ask Mr. Mummery whether there were any symptoms of hysteria about the patient. It is not an uncommon thing to find the mouth is closed from hysterical causes.

Mr. MUMMERY.—I scarcely think so. She had suffered some little lowering of the tone of her system from insufficient food, but I did not consider her at all a hysterical subject. I understood she had perfect health up to the time of the commencement of the cutting of these teeth. Judging from the very thickened condition of the integuments, I should simply attribute the state of the parts to the often-repeated attacks of inflammation excited by the

advance of the wisdom teeth, and much aggravated by the ragged edges of the second molares.

Whenever the patient took a slight cold, fresh inflammation was set up, the contact of the antagonist teeth with the swollen gum increased the severity of the symptoms, and the neighbouring muscles of the jaw were affected.

Mr. IBBETSON.—In connection with the subject of difficulty in the eruption of the *dentes sapientiae*, I may mention a case which was brought to me recently. The patient had been suffering from all sorts of anomalous symptoms, for which different causes had been assigned, and he had undergone treatment from various hands. He was brought to me by a surgeon, who, on first seeing the case, believed that the symptoms arose from necrosis. A fistulous opening in the neck, at the anterior margin of the sterno-cleido-mastoid muscle, had been probed to the extent of seven inches in the direction of the angle of the jaw, in the expectation of meeting with a piece of necrosed bone in that locality. Failing to discover any indication of such condition, the case was brought to me under the impression that it might have some connection with the eruption of the *dens sapientiae* tooth, the patient being about forty years of age. I examined the mouth, and found that the second molar was very near the base of the coronoid process; so that if the wise tooth was there, it was obviously incarcerated. I suggested that, seeing the patient had been for so long a time suffering, the only means of finding whether the tooth was there or not would be to remove the second molar, which I took out accordingly. When it was removed, the wise tooth presented itself with the masticating surface of the crown in an oblique or nearly vertical, instead of an horizontal, position.

I may mention that the second molar tooth had four abortive and exceedingly pointed fangs. In connection with the case I may add, that there were in the upper jaw two lateral incisors on the left side; so that nature appears to have deviated from her path, not only in the development, but also in the number, of the teeth; the additional tooth was, to all intents and purposes, a supplemental and not a supernumerary one, being well placed in the dental arch. I may state further that although there was no indication of absorbed surface upon the second molar tooth, still there were obvious effects of the advance

of the wise tooth upon its distal approximal surface, a kind of fossa presenting itself in that locality, in which the crown of the wise tooth was imbedded.

The PRESIDENT.—Mr. Bridgman expressed his desire to answer the arguments which might be advanced against the paper which he read at the meeting before last; and as he did not attend our last meeting, the discussion was again adjourned with the hope he would be present this evening. I am sorry to say he is not here; consequently, we have no alternative but to go on with this adjourned discussion. Will any gentleman open the discussion?

Mr. TOMES.—With respect to Mr. Bridgman's paper, the discussion on which was adjourned upon a motion proposed by myself, it may be expected perhaps that I should have something to say upon its contents; and I may state that I look upon this communication to the society as one of great importance and value, not so much, perhaps, from the certainty of the deductions from the facts that the author has brought before us, as from the circumstance that he has, as it were, broken new ground, and, entering upon an old subject, has examined it from a point of view which I think had not been previously taken, or at all events had not hitherto been elaborately worked out. The early part of the paper is occupied with the consideration of physiological matters, and there are several points he has touched upon which I think may fairly become the subject of comment. In one part of the paper I notice that he compares the enamel and the cementum of the teeth to the hard horny covering of the skin; he compares these tissues with the horn-like epidermis that we find about the fingers. Now I do not see how the cementum, which in point of structure is so like bone, can be compared with tissues such as either the epithelium or the epidermis. The substance of the epithelium or the epidermis is, we all know, made up of scales that are produced from below, their production being constant; while they are as constantly worn off at the surface. Again, the epidermis we can scarcely call a living tissue. The cementum, on the other hand, is a structure similar to bone. Like bone, it is subject to absorption, and capable of reproduction; and we occasionally find cementum, when the amount is considerable, tenanted by vascular canals. In horny tissues, on the contrary, however, we get no evidence of the kind of organs above; therefore I do

not see how Mr. Bridgman can fairly compare the cementum with the epithelium or the epidermis. Then, again, in reviewing the structure of the teeth, he compares dentinal tubes to the papillæ of the skin or of the mucous membrane. It is difficult to see how that comparison can hold good. The papillæ of the skin evidently afford an increased surface for the distribution of nerves; but it cannot be shown that in teeth the dentinal tubes assist to increase the external surface in the same way that the superficial extent of the mucous membrane of the skin is increased by the papillæ: therefore I do not see how Mr. Bridgman's comparison can be maintained. He may compare the tooth itself with a papilla; but when he compares each dentinal tube to a papilla, I do not think the comparison can be fairly justified. There are other points in Mr. Bridgman's paper which I confess I do not fully understand, and cannot therefore make any observations upon the opinions advanced. As regards his endeavour to account for the acid condition of the carious portion of decayed teeth, it appeared to me, at the time the paper was read, that a very fair explanation of the subject was given; but on again going over the ground, I am led to suspect that the generation of lactic acid will not account for all the effects which are observed in connection with carious teeth. He points out that decay in animal tissue leads to the production of lactic acid; and supposing we found in carious bones, an acid secretion in connexion with the diseased bone, I think we should have reason to suppose Mr. Bridgman is right. In almost all instances, however, of caries occurring in bones, the secretion discharged from the wound is alkaline; yet the circumstances favour the formation of acid; that is to say, you have decaying animal tissue going on in the presence of warmth and moisture both in carious bones as in carious teeth. Unless Mr. Bridgman can account for the difference of condition in those two cases, I do not think we shall be fully prepared to accept his explanation of the manner in which the dentine is softened. The paper read at the last meeting of the society by Mr. Coleman would also tend to show that the explanation offered by Mr. Bridgman of the process of softening in dentine is not in every respect satisfactory. The paper, as a whole, I think is of great importance, and though it may not explain all that Mr. Bridgman hoped that it would explain, yet it may ultimately lead to very great extension of knowledge upon the im-

portant subject of dental caries. (Hear, hear, and applause.)

Mr. ARNOLD ROGERS.—Sir, I much regret that my state of health has for some time past prevented my attendance at these meetings; but I have been much gratified during my illness by reading the reported accounts of the proceedings of the society, more especially with regard to the two last papers which have been brought before your notice. It cannot be questioned but that it is of the highest importance to have papers of this kind constantly brought before us. That the decayed state of young people's teeth, at the present day, is due to a condition which did not prevail in former years, in young people of the like age, must be evident to every practitioner of long standing, and our present knowledge upon this point does not appear to supply us with any clue towards solving this mysterious change. In former years it was accounted a comparatively rare occurrence to hear of a person having a tooth drawn; the patient would in those days have met with as much sympathy upon such an event, as a man would, now-a-days, receive after the removal of a limb; whilst now it is a rare thing to find a child of ten or twelve years of age with a sound six-year-old molar tooth. Why is this? I think our investigations should be directed to the question, as to what period this altered condition of the tooth-substance can be traced, and to its increased and increasing morbid tendency. A calamity so universal must have had its origin in something equally general. I must say, that I think we ought to look for the cause of the inferior condition of the teeth of the present day, as compared with their more perfect state fifty years ago.

The paper read by Mr. Bridgman is an excellent one, and will no doubt produce in the minds of every one of us a desire for investigation; this, the suggestive character in fact, constitutes a most valuable feature in the paper. That of Mr. Coleman is also an excellent paper, and of much similar import. Until we had these professional meetings, we knew not each other's sentiments; men kept all knowledge to themselves. Now, here, without any sort of vanity, it is the duty of everyone to express his opinion, and to aid in the development of science: if we do not do so, we do not perform a generous part. I hope that gentlemen, even if they do not now express their opinions upon professional

questions, will investigate for themselves, and hereafter all will profit by the result. (Cheers.)

In reference to these papers, I would remark, that the recognition of the acids in the mouths of patients who have suffered from defective teeth, and of the presence of which acids, as far as I remember, no notice has heretofore been taken, is due most certainly to the application of chemical knowledge; but may not the altered character of these organs contribute largely towards producing such conditions in the properties of the fluids of the mouth?

We are told that in certain experiments performed out of the mouth, the presence of acetic acid, butyric acid, and lactic acid has been detected, and that they exist in the saliva under certain conditions of that fluid; but it has been asked, whether a great difference might not be expected to result from the action of the saliva upon living tissues whilst in the mouth. We have yet to collect information upon these points, but the society is much indebted to gentlemen who so praiseworthy employ their leisure hours in experimental researches.

I would further remark with regard to the propriety of applying a small quantity of alkali, either chalk or magnesia, to carious teeth, that is one of the practical features of Mr. Bridgman's paper. He proposes to prevent the discoloration of the teeth, which resulted from amalgam, by the use of an alkali; and he speaks of continuing the application for a few minutes (ten minutes). I have employed these substances about the teeth of individual patients for two or three years, and have found that the application has not been so successful as I could wish, unless employed for that length of time. I have been in the habit of employing this treatment after an attack of fever, when the whole dental system has been attacked with that peculiar softening about the necks of the teeth, and the edge of the enamel, with which we are all familiar. I am not aware that you could do anything better with such teeth than apply an alkali, in the way of magnesia (chalk I employed formerly, but it produced constipation). It was employed in the following manner:—The patient was directed to thoroughly clean the teeth, both before, and after each meal. After the cleansing process, the magnesia is introduced, and allowed to lodge about the interstices in and about the teeth.

After this application had been used for some time, I found a favorable change had taken place; the straw colour was succeeded by a light brown-coloured surface, and after continued use a further change was observed; the brown was eventually replaced by a black surface, and there seemed a perfect arrestation of the disease; and I have been enabled by this treatment to remove the whole of the damaged part. I have had patients whose teeth have remained in a dormant state of decay for years; the disease progresses only at a very slow pace, or is altogether stationary; and this condition was obtained solely by the use of magnesia. It is wise to suggest this remedy, seeing that patients can readily employ it. They should be directed to take a mass of carbonate of magnesia, previously made into a stiff paste (like dough) with water, about the size of a large marrow-fat pea, and lodge it on the tongue, and through its agency rub it thoroughly about the interstices of the teeth immediately after each meal, having previously brushed out the food. I have found this treatment very beneficial; but I do not think the application of an alkali for ten minutes only would wholly effect, in all cases, the purpose Mr. Bridgman seeks to gain.

THE CHAIRMAN.—As this paper of Mr. Bridgman contains a great deal of research, I think it desirable that gentlemen who are better acquainted with chemical tests than I am—who have had opportunities for investigation which I have never enjoyed—should assist us with the results of their experience. I am satisfied it is a matter highly deserving diligent research and inquiry. I am also of opinion that Mr. Coleman's paper has induced many of us to look more deeply than we have hitherto done into this subject. I am quite sure that there are many here who, if they felt disposed, could make some very interesting remarks upon these matters. I had the promise of a paper from Mr. Bartlett, who writes to say he is very sorry he could not read it this evening, as he is suffering from severe cold and hoarseness.

MR. COLEMAN.—Mr. Bridgman's paper does not, I think, state that the lactic acid is furnished directly by the decomposing dentine, but if I recollect rightly—and I read the paper with some care—by the action of the decomposing dentine on certain constituents of our food; a view which, it appears to me, has been suggested in a foot-note in the former

work of Mr. Tomes.* That the acid found in the cavities of carious teeth, or rather, I would say, in the softened dentine of such teeth, is lactic acid formed by the action of decomposing dentine on the sugar contained in food, would be a very difficult matter to prove or disprove, as it could hardly be collected in a sufficient quantity for analysis; the salts formed by the lactic acid would be soluble, and consequently dissolved almost as rapidly as formed.

My reasons for believing that the acid found in the softened dentine is not lactic acid, but an acid phosphate of lime, are that the acid condition is found in softened dentine where there is absolutely no cavity where the food could lodge; that those portions of the dentine least permeable to fluids appear quite as acid in character as those at the surface of the cavities, which would hardly be the case if the acid proceeded from without inwards; and because this acid is found in decomposing bone-earth when exposed to a process of fermentation.

With regard to the acid being furnished by the saliva, or by the action of decomposing dentine on this secretion, an experiment I recently performed, where dentine was exposed to the action of saliva at the temperature of the mouth, the fluid, which at first was neutral, soon became strongly alkaline, whilst the exposed dentine was not in the least affected. I have made several other experiments like the above, tending, I think, to throw light upon this subject, which I hope to communicate at a future meeting of the society.

There are many points in Mr. Bridgman's paper deserving our best attention. The view that the teeth should be regarded as what might be termed modified skin, rather than as dermal appendages, though very ingenious, is not, I think, as Mr. Tomes has just remarked, so correct as the latter view. Skin, in certain portions of the body, appears to be endowed with certain organs; and in those remarkable tumours found in the testes and ovaries skin is often developed, with its appendages, teeth, hair, nails, &c. I think, also, the researches of Mr. Paget in the development and structure of hairs, as well as similar investigations of other physiologists and histologists, tend to lead us to adopt

* 'A Course of Lectures on Dental Surgery and Physiology,' by John Tomes, F.R.S., page 211, footnote b. Possibly the decomposition of the gelatine may furnish an acid of sufficient strength to rob the contiguous dentine of its lime.—ED. 'Brit. Journal of Dental Science.'

the view of their being developed in the skin, and not being modified portions of that structure.

Mr. CATTILIN.—One of the errors into which we appear to fall in all discussions of this kind is that we endeavour to fix upon some *single cause* of a disease which evidently may arise from many and various causes. All practical dentists must admit that caries is produced at one time by chemical and at another time by mechanical action, but most frequently by those causes which, vitiating the blood, alter the secretions, and give rise to a strumous or unhealthy constitution. May not the changes which have been observed in the teeth of the present generation be as rationally referred to the altered circumstances under which we live, and the more extensive adulterations of food and atmosphere? May not that change of constitution, which has altered the type of other diseases, have also laid the foundation for the diseased condition of teeth which has been noticed. On account of the frequent epidemics of scarlatina, measles, &c., many children now suffer two or three attacks of those diseases during the time of first and second dentition. Causes of this kind, and any others which enfeeble the constitution during the formative process, predispose tooth-bone to take on diseased action at a more advanced period of life. Mr. Bridgman and Mr. Coleman have prominently alluded to the weaker acids found in the cavities of teeth, as the *cause* of caries. Doubtless in some instances acids acting upon dentine in a *low state of vitality* will have the effect attributed to them; but in many cases they are the result of decomposition, rather than the *cause* of disease. I have ventured to call the attention of the society to the *constitutional* causes of caries, because we are too apt to neglect them, and to attribute the evil under discussion entirely to local action. (Loud applause.)

Mr. TOMES.—The one strong point in Mr. Bridgman's paper is this, he attempts to show that the acid condition of softened dentine in decayed teeth is due to the presence of lactic acid, and in that respect I think that his explanation is both novel and ingenious. As regards the predisposing causes of dental caries, he did not go so fully into the question. I think he simply related a number of causes which we should be prepared to acknowledge as sufficient in so far as predisposing causes are concerned. In

that respect, I think there is no novelty in his paper. The novel point, so far as I have studied the paper, consisted in the explanation of the acid condition of the softened dentine in decaying teeth.

The PRESIDENT then said:—Mr. Truman has promised us a paper "On the Necessity of Plasticity in Mechanical Dentistry." We shall be glad to hear this at our next meeting.

The meeting was then adjourned.

THE DENTAL HOSPITAL OF LONDON.

A PUBLIC dinner in aid of the funds of this institution took place at the "Albion," Aldersgate Street, on Thursday evening, the 25th of April, 1861.

The chair was occupied by Professor Owen, F.R.S.; the Vice-Chairmen were A. Rogers, Esq., Campbell De Morgan, Esq., and R. Hepburn, Esq.

The guests numbered about 180.

Upon the removal of the cloth, the CHAIRMAN rose to propose the first toast. He said:—"Looking round upon this broad empire of Great Britain, we find it constitutionally governed by the most benignant ruler that ever nation or people obeyed, and therefore it is that we exult in her triumphs, rejoice in her joys, and mourn with her griefs and bereavements, with a heartfelt sincerity unknown, I believe, in any other country in the world. Gentlemen, I beg to propose as our first toast the health and the long life of Her Most Gracious Majesty the Queen."

The toast was drunk with the usual honours, the guests standing while the National Anthem was sung by Miss Ransford, Mr. Ransford, Mr. W. E. Ransford, and Mr. W. Dawson, with a pianoforte accompaniment.

The next toast was proposed by the CHAIRMAN in the following terms:—"It would be very difficult for us to estimate the blessings to our country that have followed the marriage of our Queen with her present illustrious consort. I believe I may in a few words, and in a most comprehensive way, merely state that his Royal Highness the Prince Consort is in every way worthy of our gracious Queen, and of the mighty empire over which she rules. (Applause). They have been blessed with a numerous royal progeny. We have seen that their eldest son (our future

sovereign) has already made a journey to a remote colony, and has communicated with its inhabitants as between sovereign and people, and received their greetings in that relation, in a manner that justifies all that might be expected from his excellent training by his royal parents. And in reference to His Royal Highness Prince Alfred, I can say, that when in Southern Africa, where he took part in the noble sports of the field, he was not unmindful of the interests of science, for he brought back some most valuable specimens of natural history as presents, which are now engaging my attention. I am sure we may drink to the health of the Prince Consort, the Prince of Wales, and the rest of the Royal family, with enthusiasm." (Loud applause).

The toast was accordingly drunk. The song "Come o'er the brook," was then sung.

The CHAIRMAN, in proposing the third toast, said, "I think, gentlemen, most of us here are desirous of promoting the benefit and the welfare of mankind; but it is certain that neither art nor science, nor any progress of the mind, can go on comfortably except under a free constitutional government. To maintain our State in the happy position in which it has been placed, we must show a good front, we must be prepared to repel hostility, we must be as ready with our sword as with our pen; and we, who live at home with comfort and ease, ought to be grateful to our young brethren who are ready to go abroad to fight our battles for us. We are proud, and we have reason to be proud, of the achievements of our navy and our army. I believe they have never gone uncalled for, or presumptuously, into the field. Perhaps, indeed, our late war would show that we have rather kept behind, and only showed the metal that we are made of, when it has been impossible to do otherwise. I will not trespass long upon your time in proposing this toast, for I feel it would be unnecessary for me to waste it, by alluding to events present to our minds, which show that distance is no bar to our manifesting our power where it is needful. But besides the achievements of our regular navy and army, we of late have witnessed another phenomenon in our country, of the most gratifying description. We have returned to the old manly exercises of our ancestors. We have exchanged our old "Newington Butts," and a hundred other butts in merry old England, for butts at which we aim (in accordance with our

progress in science) not with the bow and arrow, as of yore, but with the rifle. We do not mean by this to give a challenge to, or to excite animosity in the minds of any of our neighbours. We only think it right to prepare for contingencies, and we moreover believe it is the healthiest and most appropriate exercise of our manhood, and we have our youths by hundreds of thousands ready to occupy and amuse themselves in this exercise. I propose to you, gentlemen, that we drink to "the health, success, and prosperity, of our Army and Navy, and our Volunteers."

The toast was drunk amid loud applause, and was followed by a song from Mr. Ransford, "True courage."

The CHAIRMAN then introduced the fourth toast, as follows: "In considering the next toast that I have the honour of proposing to you, the first reflection that occurs to me is, that in the earliest evidence we possess of our own species, we find man disposed to turn the external facts of nature to his own behoof and profit, and so we have gone on exercising our faculties of observation and experiment (our peculiar privileges), first, in the manufacture of weapons, and next, in the acquisition of further knowledge of the powers of nature, turning them to our own advantage, and to the profit of our fellows. These achievements of our forefathers have been followed by those of superior kinds of intellects, that have considered the laws that are to guide our observations, and which teach us how rightly to deduce our conclusions from experiments. Of old, we find, in the glorious people of Greece, all these attributes of humanity raised to a high pitch. Then there was a decline—for, the progress of all good seems to be something like the waves of the sea beating upon the shore, gaining a little here and losing a little there, although, in the end, doubtless advancing—making a progress in the main. But as knowledge revived, it became requisite to lay down rules, and to found institutions for acquiring languages, in which the experience and observation of enlightened nations were embalmed, and from which they might be extracted—and these institutions, coupling with tuition such wisdom as they learned from the acquisition of those languages, taught rules of logic, and those principles by which the widest and grandest laws of nature might be comprehended. For language, logic, and mathematics, we are proud of our ancient universities of Oxford and

Cambridge. We revere those institutions, as of right we ought, and are grateful for them. And then there is produced by these institutions that perhaps more useful education than the education which is imparted by professional tutors—the education which arises from the commingling of the youth of our country with their seniors at these universities, which forms the character of the true English gentleman. We see the fruits of all that. Take, for instance, the young man of great wealth—in the eyes of many, of unbounded wealth—and perhaps it may seem so to himself, when he is young, with all his capabilities strung to the highest. There is the trial—and we judge a man by the use he makes of such powers and capabilities! He may use them to the further perfecting himself. He may give up his time to enter our legislature, to enter into the spirit of our improvements, to advance education, to devote himself to public matters, to glance right and left as a legislator, and, associating himself with our own interests and wishes, to the procuring the insertion of a clause into an Act of Parliament which is the basis of our presence here to night—(Loud applause) a clause such as the licensing for practice the dental surgeon (renewed applause), and the recognition of the practice of dental surgery as an enlightened and gentlemanly profession. Such a man, the fruit of our glorious principles of education, I could also conceive as one who would devote his great fortune to the promotion of important objects, without being able, perhaps, always to foresee the results, but conscious that there are about him men who will estimate what he has sacrificed to make practical improvements, and to show the world what English science and English enterprise will do. I am sure, if I look about for such a representative of our English universities, I shall not have far to seek. I give you “The Universities,” associated with the name of “A. Beresford Hope, Esq.”

This toast having been drunk, the glee “Where art thou, beam of light?” was sung.

Mr. BERESFORD HOPE, in acknowledging the toast, said: “I feel a peculiar difficulty in expressing my appreciation of the honour which you have so kindly done me in coupling my name with this toast. It has been my good fortune to be the instrument, but a most willing and a most earnest instrument, of introducing into an Act of Parliament a clause, which I believe will be of great public benefit. (Loud applause.)

I take no merit to myself, and I should be sorry if any merit were attributed to me, for the really small amount of trouble which it gave me to procure the insertion of this clause. I wish, indeed, the labour and difficulty had been more (the success being equal), for I am sure it would have been a labour well bestowed. At the very first, when friends whom I honour and respect proposed that clause to me, I saw, and could not fail to see, how very advantageous it was, not merely to those gentlemen whom it more immediately concerned, but how desirable to the community would be the incorporation of the Dental profession with the College of Surgeons. I accepted at once that honour—it could not be otherwise—and I am sure all must rejoice at the practical fruit they now see arising from it, in the institution of that noble Hospital, in support of which we meet to night. Sir, I think there is a connection between the toast and this Institution, for what are our universities but what you, in your eloquent language, so clearly intimated—the embodiments of a system of liberal education for the pursuits of liberal science? Our universities, as the name itself indicates, are the schools for knowledge. There is no doubt that our universities grew up, and disseminated in the middle ages, a large amount of general knowledge as compared with smaller schools and colleges for special instruction; but those schools for special and technical instruction are not antagonistic to the more general embodiment of the discipline of the human mind which our universities effect. In England, we find, that education is one of the great safeguards of the nation. It is, in truth, a part of the constitution, if we deal with the word constitution not merely in the narrow sense of the estates of the realm, but as the designation of a whole nation—and in this broad and liberal use of the word constitution, I say the extension of education is one great element of discipline. That branch of science which this Hospital represents has hitherto been, as it were, pushed out of proper view, but now you have been enabled, yourselves, to form a school in connection with it; and let me ask, is not this another embodiment of the same spirit that has created our universities—that is to say, is it not an embodiment of that vigorous energy of the English race which *will* carry out all that it wants strongly to do? I am satisfied so long as we go on in this course—so long as we are not bribed on the right hand or

deluded on the left hand—so long things will go right with us. In the name then, sir, of our universities—in the name, that is to say, of learning (and I take this new school as representing a most important and a most scientific branch of learning)—I trust that it may long flourish, I trust that it will be established upon a stable foundation, and that its progress may long be an honour to the country.

The toast of the evening was next proposed by the chairman as follows:

"Gentlemen,—The progress of anatomical investigation in the dental system, after the work of Hunter made known to us the exquisite organization of the teeth, and the adaptation of that organization to natural laws, has been most interesting. We have learnt from the study of the physiological system of these organs how closely related is their organization with the nervous system, and how the diseases of these organs lead to diseases of the adjacent tissues. This is a part of the province of dental surgery; and the Institution which we meet to-night to support has been established in order to give the benefit of this knowledge, and the scientific application of this knowledge, to our fellow men. This has ever been the issue of all the advances made in medicine and in surgery.

"We have hospitals already established for those contingencies that affect life, that affect limb, and for many other contingencies of a serious nature; but really there are very few maladies which we suffer in the course of our lives which leave so visible an *impression of suffering* as those which we suffer from diseases of the teeth, and which it is the province of this Hospital to deal with. Take, for example, toothache! I am bound to say that that wonderful individual who seems to have possessed knowledge on all subjects was perfectly correct when he stated, "that there was never yet a philosopher that could bear the toothache patiently." (Laughter.) It annihilates, so to speak, for the time, all our powers—sometimes exhausting us with the slow aching of incipient inflammation, and then prostrating us by that continuous agony which really seems to concentrate in itself all that we can suffer in the way of bodily pain. And the worst of it is, that these sufferings mostly come on, as we all know, at that season when "wearied nature seeks repose," and rob us of it—for who is there among us to whom it has not happened, at some time, to have laid his head upon the pillow and been kept

awake all night from this pain, and just when worn-out nature has given way and we have fallen asleep, the bell has rung, and we have been obliged to get up without our necessary rest? Now this applies to all branches of the community—the labourer, the mechanic, the shopman, the domestic servant, all in turn are pestered, bewildered, and distracted by this terrible malady, and so incapacitated for their employment by it, that they must get relief from it at any price, and at any amount of suffering. Now really this is a very great evil, and it is doing a vast deal of good to provide for these persons the means of proper and scientific relief from it. There is no doubt that all these poor sufferers can go to the nearest chemist, and for a shilling or half-a-crown have their teeth roughly taken out, or broken, or, perhaps worse than this, have their jaws broken (laughter); but these are not the sources of relief to which these poor creatures ought to be driven. But to relieve toothache, gentlemen, sad as is this grievance, is not the only, nor indeed the main object of this Institution. Its objects are to afford to the poor the advantages of the higher departments of the dentist's art—to treat the diseases of the teeth and adjacent tissues in a way to anticipate and prevent, not only this horrible malady, but also those most formidable and serious maladies which too frequently follow the neglect of these diseases in their early stages—such as alveolar abscesses and their consequences, diseases of the antrum, necrosis of the jaw-bone, and malignant diseases of the adjoining tissues, &c., &c.—of which our hospital surgeons see so many arising from this cause, and which constitute some of the most formidable diseases to which the human frame is subject.

"Well, to meet these evils, you have founded this admirable Institution. Some of us may recollect the beginning of similar institutions, that seemed to the minds of some persons to be springing up, almost unnecessarily, for the relief of the particular diseases connected with the senses of hearing, of sight, and so on, but we find that they *have* grown up, and met with great support, and so unquestionably shall we. I believe there is no case in which the householder, the merchant, or the wealthy shopkeeper would not wish to be able to give to their dependents the relief from their sufferings, and the restoration to good, active, remunerative employment, such as the Dental Hospital affords, if they but

knew of its existence. Gentlemen, the report of this hospital shows unmistakeable signs of the success of the methods used for the relief of the suffering poor; but the public as yet probably do not know how much good you are doing. I am sure the Institution will be of immense benefit, and only requires to be known to be patronised.

"Then the organization of a Dental School in connection with this hospital clearly furnishes the best and surest means of advancing the progress of the practical application of scientific dental surgery. Your lectures, your instruction, the opportunity it affords of seeing a great diversity of cases, will lead to the efficient education of young practitioners. This last step which you have taken (and which the increased and increasing knowledge of the age called for)—the establishing a system of education—clearly shows how widely it will spread over the land the application of the true principles of what we know of the anatomy, and physiology, and pathology of the teeth, and the systems of practice founded upon that knowledge.

"Why should I say more—why, indeed, should I have said so much to recommend this Institution to your support—when you all know better than I can know what the Dental Hospital is, what it deserves, and the claims it has upon the public? I wish they could be known through the length and breadth of this metropolis, at least, and I am sure, then, the balance on your next year's account would be very different from that of the present. Gentlemen, allow me to say in conclusion, that there is no one who has been engaged in the investigation of what relates to your department of science, who will not feel abundantly repaid by the study of the subject itself; but, that I feel it to be a very pleasing and a very acceptable evidence of your appreciation of my work, devoted to your particular branch of science, that I should have been called upon to preside over the present meeting, and that I should now be here, standing before you in my present honorable position, and entrusted with the duty of advocating the claims of your valuable Institution—in the progress and success of which I shall feel from this time forward more heartfelt gratification than ever. I propose to you 'The success and progress of the Dental Hospital of London.'"

The first list of subscriptions received was then read by Mr. Harrison, after which

Miss Ransford sang the ballad, "Wake, sweetest melody."

Mr. THOMAS BELL, F.R.S., proposed the next toast—He said: "Gentlemen, instead of addressing the chair, it now becomes my duty to address you all. After the very eloquent speeches you have heard from my friend on my left hand, it happens most fortunately for me that the toast which I have now to propose to you needs no long speech to recommend it—it is the health of our distinguished Chairman."

"I think it happy both for myself and for you that this requires no long speech—for myself, because I should not do justice to the subject—and for you, because I shall not distress you with my incapacity. My acquaintance with the Chairman might well lead me to dwell upon those qualities of mind and heart which endear him to every one who knows him as well as I do, and who has had opportunities of experiencing that kindly and affectionate friendship which I have often indulged in. But, gentlemen, I have no need to detain you upon this phase of his character, nor is it necessary that I should dwell upon that high scientific position which he so deservedly holds. It is too well known to require me to dwell upon it for one moment. It is, gentlemen, in reference to the benefit he has afforded to the members of our profession that I would beg your attention for a few moments. In his exposition of Hunter he brought to his labours a genius equal to that of his 'great master,' a power of application and of labour, a mental power of generalization, I will without hesitation say, equal to Hunter himself, with an education, and genius, and science far greater than that great man possessed. I say, it is impossible that he could have brought to his work other than a love for that branch of study for which he is so distinguished. It was Hunter who first of all expounded the structure of those organs, the practical application of whose doctrines to the treatment of which we have met this day to celebrate: it is to Professor Owen that we owe the full exposition of that structure. No one who knows that work—that most beautiful and most interesting work—upon the physiology of the teeth can help appreciating in the highest possible degree the labours of Professor Owen, and the admirable results which those labours have had. But it is not only in that work, but in all his subsequent labours, that he has shown so much of the structure and physiology of the human frame; and it is to Professor

Owen that we are indebted for that extensive generalization of the subject, in which he far exceeds Hunter. The thanks of the profession are eminently due to him. We have hailed his presence here this evening, because it proves so fully his wish for the prosperity of the practical working of our system. The manner in which he has advocated our cause, the eloquent speech which you have heard from him in our favour, and everything that has emanated from him in connection with this Institution, must, I am sure, fill your hearts, as it does mine, with the warmest gratitude and thankfulness.

"I will now address myself to the Chairman. May I be permitted, sir, to mention one or two points, connected with my own sentiments on the subject which has brought us together to-day? Throughout my life it has been my wish that I might live to see the day when the dental profession was recognised as a branch of surgery. Those who know me well, know that it has been the warmest wish of my heart that our profession should be placed upon a legitimate footing. Thanks in a great measure to the honorable gentleman on my left, we have emerged from that darkness, from that gloom which so long threatened almost to overwhelm us in the branch of dental surgery, and it will not be long, I hope, before we shall have established a complete organization of it! I confess that I shall now retire from professional life far happier than I otherwise should have done, having lived to see a Dental Hospital established in London, accompanied by a regular school for teaching dental surgery, and supported by men of education, men of attainments, men of high professional character. Although it has been the warmest aspiration of my heart for the last forty years, I certainly never anticipated, and never could have expected, to see this; and I confess to you that it is the proudest day of my life, that I should have the opportunity of being present on such an occasion as the present. I hope, gentlemen, that you will pardon this digression, and I beg now to propose to you the health of our Chairman."

The toast was then drunk amid loud applause, followed by a ballad from Mr. Dawson—"Beautiful blue violets."

The CHAIRMAN, in reply, said:—"I have to thank you sincerely and gratefully, gentlemen, for the kind manner in which you have received the toast proposed by my friend, Professor Bell. I accept the

favour as payment in full for all I have done for the dental profession, and I drink with great pleasure to all your good healths."

Mr. HARRISON then proposed "The Vice-Presidents of the Dental Hospital," remarking "that among them there were men of the highest distinction in the Church, in the State, and in the medical and surgical professions—and among the latter, men particularly distinguished for their great literary and scientific attainments—men, therefore, whom they might well be proud to have associated with, and patrons of the Institution, the interests of which they had that day met to advocate." He concluded by connecting with the toast the name of Dr. Mayo, President of the College of Physicians of London.

The toast having been drunk with cordiality, Dr. MAYO returned thanks for the Vice-Presidents and himself. "The occasion," he observed, "was one which, though he had long hoped for, he had scarcely anticipated realising." He concluded by expressing himself perfectly satisfied that the plans formed regarding the hospital would be carried out.

A duet was then sung by Mr. and Miss Ransford—"Tell me, gentle stranger."

The CHAIRMAN next proposed, "The Medical Officers." The word hospital, he said, was an abstract term—the soul of a hospital was the medical officers—those who communicated the results of their experience in science—those who gave the benefits of the hospital to persons seeking its aid—the lecturers being those who imparted knowledge to the students of the hospital for the advantage of posterity. "Gentlemen," he continued, "you are fortunate in both the medical officers and the lecturers of your hospital, for among their names are those of men recognised throughout Europe for the originality of their observations and the extent of their knowledge. We depend upon the energies, skill, and devotion of the officers of the Dental Hospital. We have had abundant evidence of their devotion to it, and we are induced to take this opportunity to award to them our thanks. I beg to propose, 'The officers of the Dental Hospital,' accompanied with the name of Mr. Hepburn."

This toast was enthusiastically drunk, and Mr. HEPBURN replied as follows:—"Mr. Chairman and gentlemen, gladly indeed would I have been silent upon the present occasion, and gladly would I have resigned the duty and the honour of responding to this toast to any of my

colleagues, who, I am quite certain, would have done more justice to it than I can do. However, sir, I beg to thank you for the honour you have done us in proposing our healths, and you, gentlemen, for the warm and, indeed, enthusiastic manner in which you have received the toast. I may say that, from the first, my colleagues and myself have felt, not only the honour, but the responsibility of our position. We felt that the opening of the Dental Hospital was the inaugurating of a new era in our profession. We felt that it would not only be a great boon to the poor, but invaluable as a school for enabling students to gain that thorough knowledge of our specialty, in addition to the general knowledge of surgery to be acquired elsewhere, which is now become so necessary, in accordance with our chartered diploma—that diploma which we have received through the exertions of certain members of our profession (and, in naming those men, I would particularly allude to Mr. Arnold Rogers, Mr. Tomes, and Mr. Harrison), and also through the instrumentality of the College of Surgeons. In thanking you, sir and gentlemen, for the honour you have done us, I cannot help expressing the sentiment which is now predominant in my breast, and those of the medical officers generally—which is, to assure you of the pleasure it affords us to see on this occasion the spectacle of so large an assembly here. This, we think, augurs well for the prosperity of our hospital, which has been established for the benefit of those whose circumstances preclude them from obtaining elsewhere the advice it affords, and of whom I may say, that the poorer they are, the more worthy we consider them to receive relief.” (Applause.)

Mr. HARRISON then read a second list of subscriptions (the whole amounting to upwards of £800), and concluded by thanking the gentlemen present for the liberal manner in which they had contributed to the object of the meeting.

The song, “My old friend John,” by Mr. Ransford, which was encored, terminated the proceedings of the evening, and the company separated at about half-past eleven o’clock.

LEE v. GRIFFIN.

(From the ‘Times,’ May 10th, 1861.)

THIS was an action in which the plaintiff, a surgeon-dentist in Moorfields, sued the

administrator of a Mrs. Penson, to recover the sum of twenty guineas, as the price of two sets of teeth made for the deceased lady upon her order. At the trial, which took place some time since, before Mr. Justice Crompton, the plaintiff stated that he received a verbal order from the deceased lady to make her two sets of teeth; that he took a model of her mouth, and some time after he wrote to her, and asked her to make an appointment for an early day, as the teeth which she had ordered were ready for her. He also produced a letter which he said he had received in answer, in which, after merely thanking him for his kindness, the deceased lady said, “My health will prevent my taking advantage of the early day.” The old lady died some time after, before the goods were delivered, and when the account was sent in to the defendant, he disputed his liability.

Mr. Justice CROMPTON expressed his opinion that this was not a sufficient memorandum in writing within the Statute of Frauds, and was about to nonsuit the plaintiff, when the plaintiff’s counsel suggested that the plaintiff might recover under the count for work and labour and materials.

The verdict was then entered for the plaintiff for twenty guineas, and the defendant had leave to move. A rule having been accordingly granted.

Mr. PATONETT now showed cause, and contended, on the authority of “Clay v. Yates” (1 H. and N., 78), that when the skill of the artist was the chief ingredient in the value of the article, he could recover for his work, labour, and materials. He also contended that the letter of the deceased referring to the plaintiff’s letter (the contents of which were proved by parol) together made up a contract in writing within the Statute of Frauds.

Mr. J. O. GRIFFITHS, who appeared in support of the rule, was not called upon.

Mr. Justice CROMPTON said, he was of opinion that the rule ought to be made absolute. There was no pretence for saying that there was any contract in writing within the Statute of Frauds; and, independently of that (as had been observed by Mr. Justice Hill), it was difficult to see what course of action the plaintiff could have had, seeing that the contract was, that the teeth were to be fitted to the lady’s mouth, which they never had been. A question was raised at the trial, whether this was a contract for work and labour and materials, or for a chattel to be sold

and delivered. His lordship thought it was the latter, and as there was no contract in writing, within the Statute of Frauds, the plaintiff ought to have been nonsuited.

Mr. Justice HILL and Mr. Justice BLACKBURN were of the same opinion. Rule absolute to enter a nonsuit.

The Month: Miscellaneous and Scientific Intelligence.

THE BIRMINGHAM AND MIDLAND COUNTIES DISPENSARY FOR DISEASES OF THE TEETH.

13, TEMPLE STREET, BIRMINGHAM.

Dental Officers' Report for the Year ending December 31st, 1860.

Number of patients admitted from December, 1859, to December, 1860 :

Males	931
Females	707
Total number.....	1638

Number of operations performed from December, 1859, to December, 1860 :

Stopping.....	419
Scaling	83
Extraction	2282
Various	137
Total number.....	2921

The operations under the heading "Various" include filing, treating exposed nerves, diseases of the gums, &c.

In presenting this, the Third Annual Medical Report, to the subscribers, I beg to call attention to the increased number of applicants, owing, in a great measure, to the closing of the Dental department of the General Dispensary.

(Signed)

SAMUEL ADAMS PARKER, L.D.S.

CHLORODYNE.

(From the 'Medical Times and Gazette,' Jan. 19th, 1861.)

To the Editor of the 'Medical Times and Gazette.'

SIR,—Dr. Shorthouse has recently given, in your journal, a testimonial in favour of Mr. Davenport's secret remedy,

in terms of such complete approval as only to be equalled by his confidential statement attached to those advertisements, setting forth the virtues of chlorodyne, which periodically appear in the medical journals.

I regret that my experience should be very much opposed to that of Dr. Shorthouse; but having used the remedy in several cases, and having observed effects which I cannot describe otherwise than very terrifying, I am induced to warn my medical brethren not to use it without a very close examination into the constitutional peculiarities of their patients.

I have never seen, but in one instance (a female of leucophlegmatic habit), any greater power over neuralgic complaints manifested by chlorodyne, than I have witnessed over and over again by morphia, hydrocyanic acid, chloroform, &c., and in using any of these last-named remedies we have the advantage of knowing what we are introducing into our patient's system. I have, however, seen the exhibition of small doses (ten minims) in cases of advanced phthisis, followed by such overwhelming prostration as will effectually prevent Mr. Davenport's chlorodyne from achieving any wonderful cures in my hands. In another case, that of a lady suffering severely from "tie-douloureux," twenty minims were given: the pain was for a short time relieved, but such a distressing sensation of cerebral fulness took its place that the patient declared she would sooner suffer the misery produced by the disorder than the misery produced by the remedy. For some hours after this dose, involuntary twitches of the arms and legs were witnessed. A strong, powerfully-built man having heard of the wonderful powers of chlorodyne, being worn out with neuralgia, took forty minims. Immediately after he had swallowed them he became unconscious, and did not recover his senses for some hours, and felt

thoroughly unhinged for several days, to the horror and dismay of his family.

On principle I object to anything secret, and although if I had witnessed any benefit derived from the administration of chlorodyne commensurate with the risk incurred, I should, for my patients' sakes, continue to prescribe it; yet when, in the large majority of instances in my experience, most alarming symptoms have been occasioned, with little or no relief from disease, I strongly dissuade "Inquirer" from prescribing or administering the drug. I am, &c.,

BUCHANAN WASHBOURNE, M.D.

Gloucester; Jan. 12th.

IMPORTANCE OF PRESERVING THE LINING MEMBRANE.

By F. D. OLIVER, M.D.

(From 'The Dental Cosmos,' Jan., 1861.)

IN a previous number of the 'Dental Cosmos,' I saw an article from the lucid pen of J. D. White, which clearly demonstrates the importance of preserving as much of the lining membrane of the dental canal as possible, and as I think my practice for the past four years will prove his theory correct, I will state that line of practice, which you can, if you think it of any value, place on record in the pages of your valuable journal.

I have saved a large number of teeth during the past four years, molars and others, where the pulp was exposed, by drilling a little below the neck of the tooth, into the pulp-chamber, and afterward extirpating, through the cavity of decay, the pulp in the chamber, only waiting till the bleeding has subsided, and using a saturated solution of chloroform and camphor to soothe and astringe the mouth of the canal. I sometimes fill immediately, always with good foil. If there is any pain after having cleared the pulp-chamber, I wait two or three days, or till the inflammation and pain has entirely disappeared.

Not one of all the teeth I have treated in this way has yet ulcerated, and simply, in my humble judgment, because the lining membrane of the canal has been preserved, which, together with the periosteum, has sustained the vitality of the tooth. The operation of drilling and extirpating may be rendered painless in

almost every case by passing a slight stream of electricity through the instrument.

Buffalo, N.Y.

ESTIMATE OF CHLOROFORM.

By Professor PARAVICINI.

PROFESSOR PARAVICINI, giving an account of the events at the Military Hospital at Milan during the late Italian war, after describing the benefit derived from the use of chloroform, thus sums up his opinion as to the propriety of its employment:—1. Considering the matter in a general way, the benefit of anæsthetics is too great for its employment to be proscribed, to the damage of mankind at large, for the sake of the prevention of some distant danger which may occur to an individual. 2. While it is certain that chloroform has given rise to some deaths, it is no less so that many other cases would never have recovered without its aid. 3. Prior to the introduction of this agent, many pusillanimous patients preferred certain death to the pain of the surgeon's knife. 4. The cases were by no means rare in which persons, persuaded at last to submit to operations, succumbed either during their performance, or a few hours afterwards, the moral effort and the physical sufferings exhausting their nervous power. 5. If we are to prescribe a means which, in the vast majority of cases, is of incontestable and immense utility, because in certain very rare instances it may prove fatal, we shall be led to the most ridiculous conclusions, first among which is the proscription of medicine itself, and still more of surgery. 6. A simple venesection, executed according to the rules of art, has given rise to fatal phlebitis much oftener than chloroform has led to death; but who is there with common sense that would think of passing a general incrimination and prohibition of it?—*Annali Omodei*, vol. clxxii, p. 196.

FAULKNER'S NEW RUBBER.—We have been favoured, by Mr. Rutterford, of Islington, with a view of a specimen of Faulkner's New Rubber; its colour is pleasing, and it appears light and tough, and capable of a high polish.

A PROFESSOR IN THE CHAIR.—The nobility of science as contrasted with the nobility of birth was honorably and successfully recognised this week, by our newly-adopted professional brethren, the dental surgeons. The first anniversary dinner of the Dental Hospital was presided over, not by a duke, nor an earl, nor a marquis; not by a Cabinet minister, nor a political celebrity. The chair was taken by Professor Owen; and in his person were aptly represented the highest claims which odontological science can put forth. The attendance was more numerous than has been seen at an hospital dinner for many a day. Not only was the dignity of science vindicated by the selection of the president for the first anniversary meeting, but the perfect fitness and adaptability of a man of the highest scientific attainments for this kind of social responsibility, were very triumphantly demonstrated. The number of guests attracted far exceeded anticipations, and the amount of subscriptions overpassed them in a twofold measure. We hope that this incident may afford a precedent, and that at similar meetings distinguished members of the profession may be called to preside with like felicity and equal success. —*Lancet*, May 4th, 1861.

In the list of candidates for the Fellowship of the Royal Society, selected by the council for election, two names are included in whom the members of the dental profession have a strong interest. Campbell de Morgan, Esq., who, as chairman of the Committee of Management of the Dental Hospital of London, has laid us under deep obligation for the ability and activity with which he has advanced the interest of that educational institution. Spence Bate, Esq., to whom as a valued contributor to this journal, and as an active promoter of professional education, we all are indebted.

BOOKS RECEIVED.

'Operative Surgery adapted to the Living and Dead Subject.' By C. F. Maunder, F.R.C.S. by Exam.; Assistant-Surgeon, Surgical Pathologist, Demonstrator of Operative Surgery, London Hospital; Translator and Editor of Ricord's 'Lectures on the Duality of Chancres, but the Unity of the Syphilitic Poison; Fellow of the Medical and Pathological Societies of London; formerly Demonstrator of Anatomy and of Operative Surgery in Paris; Civil Assistant-Surgeon on the Staff of the Army in the East during the Crimean

War; Demonstrator of Anatomy in Guy's Hospital, and Junior Surgeon to the Great Northern Hospital. London: John Churchill, New Burlington Street, 1861.

'Dental Register of the West,' April, 1861.

To Correspondents.

NOTICE.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.
2. All communications relative to subscriptions and advertisements are to be addressed to the Publisher, Mr. John Churchill, 11, New Burlington Street, London, W.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. The Journal will be supplied direct from the Office on PREPAYMENT of subscriptions as under:

Twelve Months (post-free)	. . .	13s.	0d.
Six Months	"	6s.	6d.

Post-office Orders to be made payable, at the Regent Street Office, to John Churchill, 11, New Burlington Street, W. A single number sent on receipt of thirteen stamps.

"Mr. C. Stokes."—Your note has been forwarded to Mr. Harrison.

"C. A. Rodway."—The maker of the flasks has a new pattern, a specimen of which will be sent you in a day or two.

Communications have been received from Messrs. C. Stokes; Hearder; W. K. Bridgman; C. J. Fox; W. Carkert; C. A. Rodway; Octavius Fox; S. A. Parker; Collis; and Rutherford.

[ADVERTISEMENT.]

TO DENTISTS.

A GENTLEMAN (Member of the College of Dentists by Examination) now in practice in a large manufacturing town, is desirous of negotiating with a Dentist in First-class Practice in London, with a view to Partnership. The Advertiser possesses testimonials of the highest order in favour of his Surgical and Mechanical Skill.

Address, E. R., 7, Suffolk-lane, Cannon Street East, London, E.C.

British Journal of Dental Science.

No. 60.

LONDON, JUNE, 1861.

VOL. IV.

Dental Surgery and Medicine.

A REPLY TO SOME OF THE OBSERVATIONS RELATING TO A PAPER READ IN MARCH LAST, "ON CARIES," &c.,

AND DISCUSSED AT THE MEETING OF THE ODONTOLOGICAL SOCIETY IN MAY,

A REPORT OF WHICH APPEARS IN YOUR NUMBER FOR THAT MONTH.

To the Editor of the *'British Journal of Dental Science.'*

SIR,—When our illustrious countryman first made the announcement of his discovery of the circulation of the blood, men listened, wondered, and were convinced.

But when the noble and generous Galileo, armed with his telescopic discoveries, came forward to endeavour to establish the doctrines of Copernicus, he was opposed, imprisoned, and even put to torture to obtain his recantation. The reason for this difference in their reception arose from the fact that, while the former was but an explanation of a circumstance up to that time almost unsuspected, and, consequently, respecting which no former opinions had been held, the latter was a trespass upon preoccupied ground;—it struck at the root of a cherished dogma, and had its powerful votaries to contend against.

So it has been with regard to the teeth. When the "chemical theory" was first propounded, the vague and undefined ideas respecting the nature of decay at once gave way to such an apparently rational and self-evident doctrine. The acidity in softened dentine was too positive a fact to be denied. And whence could it else arise but from the decomposing food and vitiated secretions of the mouth? Such, at least, was the plea of its advocates. To reason

against so seemingly settled a question is like the position of Galileo, when reminded of the absurdity of supposing he could induce men to believe that the earth was going round the sun at a most fearful rate, when every one might judge from their own senses that the earth was really standing still, and the sun revolving round it once a day. Yet, in spite of all these weighty arguments, and the so-called evidence of common sense, facts at length got the better of appearances. We should now stare, were we, at the present day, to be asked to believe that which was then deemed to be so seemingly incontestible; and I am sanguine enough to believe the day not far distant when the "chemical theory" will have shared the same fate.

When an equally successful investigator has come forward, armed with discoveries of no less importance, but far more numerous, he has been met with a most ungracious and unscientific *cui bono*?* This, fortunately, however, is the full extent of the torture our own modern inquisition has at its command. Yet it is to these very discoveries, which are the results of no small amount of investigation, that we have mainly to depend for our knowledge of the correct physiology and pathology of the teeth and their belongings.

We have at our command an abundance of both pictorial and typographical delineations of all the physiological features, even to the very minutest, of the dental organs. But, like the inspection of a picture, to judge correctly of the detail and its effect, a view must be had at different distances, otherwise in studying the means we lose sight of the end. So it must be with regard to

* *Vide* number of this Journal for June, 1857, page 391, last paragraph in first column.

the "materials" of the teeth. We obtain, by the aid of the microscope, an insight into all the wonderful arrangements which go to make up the tooth in its perfect state; but having gained this information we must then have recourse to our natural vision; we must study the picture at its proper distance to find out the true value of every patch of light and shade. We must study the teeth in a like comprehensive manner to find their true relation to the other parts of the system.

Mr. Tomes, looking thus at the enamel, the cementum, and the epidermis or epithelium "microscopically,"—that is, with regard simply to their physical appearance in structure—remarks that, "I compare the enamel and the cementum of the teeth to the hard horny covering of the skin," and says, "now I do not see how the cementum, which in point of structure is so like bone, can be compared with tissue, such as either the epithelium or the epidermis," &c. In the first place, I must beg to observe that my own words were, "*take the place of.*" I did not compare them in appearance, for no two substances can resemble each other less; but meant that one takes the place of the other, or rather, that it is *transformed* into it,—the epithelium into the enamel or cementum. The readiest way to meet the objection on this point will be to recount the various steps by which such a conclusion has been arrived at.

On referring to fig. 58, page 102, of the 1st edition of Mr. Tomes' lectures, which is a diagram representing the enamel fibres in progressive stages of development, and comparing the forms of these separate crystals with the forms of the epithelial cells as seen in fig. 2, page 38, of Carpenter's 'Animal Physiology,' or in fig. 18, page 220, of his 'Human Physiology,' 4th edition, or in figs. 312 and 313, pp. 605 and 608, of 'Gray's Anatomy,' diagrams of the mucous membrane of the stomach and villi of the intestines, it will be seen that they are not so very unlike in form, only that while the epithelial cells consist of but a single layer, the enamel is composed of several separate ones placed end to end. If we compare the hard and horny scales of the epidermis with the soft and elongated or columnar cells of the epithelium of these villi, we shall find a much greater difference in their form and appearance, although we know them to be only modified forms of each other. But if we subject the prismatic cells of the epithelium to the same

hardening process as the dentine, there will then be little or no dissimilarity between these and the crystals of the enamel in physical structure. And if we admit the conversion of basement membrane into dentine in this way, it is difficult to see on what grounds we can deny the conversion of prismatic epithelial cells into prismatic crystals of enamel.

But let us take Mr. Tomes' diagram of the section of the enamel pulp, fig. 54, page 97, showing the enamel in its several stages of progressive development. We have seen the tooth originating in a papilla*—a little hillock surrounded by a cavity, which ultimately becomes closed by an operculum, thus forming a space, or mould, for the future enamel. *The surface of this papilla, as well as the surface forming the inside lining of the bag, are both covered with epithelium.* Now Mr. Tomes goes on to observe, that "the substance of the epithelium or the epidermis is, as we all know, made up of scales that are produced from below, their production being constant, while they are as constantly worn off at the surface." True, and when they are thus thrown off from the epithelial surfaces *within the cavity, which is closed, and from which they are therefore unable to escape*, what becomes of them? Do we not find them as nucleated cells floating in the albuminous fluid or plasma—the so-called enamel pulp? At A in the above diagram, we have the coat of the sac of the enamel pulp with cells interspersed in its substance. At B the cells become enlarged and mixed with filaments of fibrous tissue. Now as Virchow's law is, that cells can only be formed from cells, these cells must have come from the cells of the epithelium, or, in other words, the cells of the epithelium, instead of being cast off and disappearing, have retained their cell-function, and have gone on filling up the substance of the so-called enamel pulp. We then see them altering in appearance, until resulting in columnar tissue and the perfecting of the enamel layer. At length the bag opens, and the tooth makes its appearance. The fold of mucous membrane forming the bag then returns to its former state, and again becomes the surface of the gum, and that which was previously the epithelium of the papilla is now the enamel of the tooth, and unless the one has been converted into the other it is difficult to point out what has become of

* 'Lectures,' page 80.

the epithelium, and whence the other has been derived.

With regard to the cementum, the same reasoning will show this to be nearer allied to the enamel than its mere structural appearance would indicate. In the early state of the enamel pulp this becomes traversed with blood-vessels; but as these are ultimately severed from their connexion with those of the cutis, they disappear as the enamel progresses; but in the cementum they are retained and their connexion is maintained. In the enamel pulp, the albumen has been furnished by vessels from the cutis, but for the cementum it has been given out by vessels which become the periosteal surface of the alveolus. In the former, there is no disposition to ossification, it is simple crystallization. But in the cementum, the lymph is provided naturally for ossification, that is, by the vessels destined for the formation of the walls of the alveolus and the lymph which ossifies on one side of the periosteum must have a tendency to do so on the other side, only as it becomes mixed with and in some degree modified by its admixture with the albuminous fluid of the dental pulp, it thus gives rise to what may fairly be termed a spurious kind of bone.

In making the objection, I am greatly inclined to suspect that Mr. Tomes may have misunderstood my meaning. With respect to my having compared "the dental tubes to the papillæ of the skin or of the mucous membrane," there can be no doubt of a misconception. I spoke of the dental *fibrils*—the occupants of the dental tubes. I ought rather to have termed them "secondary" papillæ. But I must confess I am unable to arrive at the same conclusion as Mr. Tomes, when he states his inability to perceive how the tubes can increase the extent of surface. In this respect as the fibrillæ are extensions of the sensory apparatus of the central pulp or primary papilla, and are sent out in a radial direction from its surface, surely the larger the circle formed the greater will be the extent of surface so gained, as the fibrillæ are densely packed where they start from the pulp, and branched at the periphery to fill up the extra space obtained. If we refer to fig. 125 of the 'Manual,' we find a representation of a piece of the pulp with its fibrils drawn out of the displaced dentine. There can thus be no doubt of the continuation of the pulp into the dental tubes. If we next turn to fig. 14 of the 'Lectures,' we find a diagram of the den-

tinal tubes, in which they, and we may infer their occupants also, become branched to obtain an extension of ends, and we know that it is at the ends or loops of the nerves that sensation is produced, and, therefore, I cannot see how any other conclusion than the one I have stated can be come to. If we look at the form of one of the fungiform papillæ of its next door neighbour—the tongue,* we find a modified form of the dental pulp, and we have only to imagine the secondary papillæ extended into the dentinal tubes to have a fair representation of its form. But there is a far closer analogy than this. If we trace the form and connexion of the fungiform papillæ of the tongue as terminal loops to the filaments of the *gustatory* nerve, we shall see also that the dental pulps are similarly terminal loops to the filaments of the dental nerves. Now, as all the nerves supplying these several bundles of filaments are branches of the same trunk, and alike simply nerves of feeling, and both sets connected in the same office, we may fairly class the two sets of terminal loops together as papillæ, but with this subdivision—
Papillæ of the tongue—*soft* covered.
Papillæ of the maxillæ—*hard* covered.

And, besides, having seen the dental pulps existing, first as "*soft covered*," and then becoming enclosed in a follicle, solely, to all appearance, for the purpose of having this "*soft*" covering converted into a "*hard*" one, such a conclusion would seem to be inevitable.

With regard to the presence of the acid, it is sufficiently obvious that the paragraph explaining the probable mode of its production has not been taken in its entirety. In my paper it is distinctly stated that the membrane acts by "inducing an acid fermentation in sugar." A solution of the saccharine matter being imbibed by the softened dentine, the two essentials are thus brought into contact. The instance brought forward by Mr. Tomes tends to strengthen this supposition, because in the absence of saccharine matter the result is alkaline—the ordinary result of decomposition and the formation of ammonia, &c.†

* Gray's 'Anatomy,' fig. 276, page 548, Carpenter's 'Human Physiology,' &c.

† This fact will be a sufficient disclaimer to the remark of Mr. Coleman, that my views were suggested by the foot-note to Mr. Tomes' lectures. It is extremely difficult, after any length of time, to trace the origin of any particular idea, or even to prevent an unintentional theft sometimes, but in this instance I can lay claim to a clear conscience. The "definition" of Mr. Tomes naturally suggests

Respecting the use of the alkali, Mr. Rogers would seem to have overlooked the difference in the conditions under which we have each had recourse to its use, as well as the purpose for which it was intended. In his own, it appears to have been made use of *with the diseased part remaining untouched*. Consequently, it has had the continuous production of the acid to contend with, and it has been only when the decaying membrane has reached that stage at which it ceases to act as an acid ferment that its full success has become apparent. In mine, it has been applied *after the removal of the softened dentine*, and at such time as when the cavity has generally been deemed fit to receive the stopping; therefore all that is required of it is to neutralize the further traces of acidity still remaining in the otherwise healthy dentine, and which I find, generally, to be effected in the time mentioned. It may easily be put to the proof by removing subsequent portions of the dentine, and testing on blue litmus paper. There is more value, however, to be attached to Mr. Rogers' remarks than may at first sight appear. They afford a strong corroboration of the position I have endeavoured to prove. It is this:—The membrane at the neck of the tooth is instanced as having first become softened. The alkali is applied daily until the straw-colour is first changed to a light brown, and then eventually to a black, and ending in a perfect arrestation of the disease. Nothing can be more decisive than this. The death of a certain part of the membrane has taken place. It becomes softened, and its *progressive* tendency is prevented, through the resulting acid being neutralized by the magnesia and thus prevented from preying upon the lime of the contiguous dentine. It has been kept from doing any further mischief to the tooth until, at length, its "slightly decaying condition" has passed by, and it ceases to act as a producer of acid. Had the acid come from any other source than the tooth, it would have reappeared as soon as the use of the alkali was discontinued, and the decay, although checked for the time, would never have altogether ceased.

The main substance of Mr. Coleman's remarks, has been answered previously in the last number of the journal. But in the allusion to the tumours in the testes

the question,—what causes the death, and what is the nature of the decomposition? And in tracing this out, the present solution was the only one that afforded any satisfactory explanation.

and ovaries where skin is often developed, their evidence may be taken as much, or perhaps rather more, in favour of my views; for as these are abnormal productions, it is more reasonable to suppose that when a departure from the usual course has taken place it would lead to the formation of a substance, not in one of its characters only, but in any or all of the forms it is ever met with, and this far more likely than that it should lead to the formation of skin and something else additional to it. Mr. Erasmus Wilson says of these, that the nails "*are a part of the scarf skin*," and that hair "*may be regarded as a modification of the scarf skin, and analogous to it in the mode of its formation*."

One can understand the number on a policeman's collar being an *appendage* to his coat, but when a body once formed a portion of the skin and still retains the same position and correspondence in its component parts or elements, it is not easy to see how that which once formed a part of, can afterwards become an appendage to, its remaining portion. It must still be a part of it, let it be transformed in what manner it may. If it be an appendage in its adult form, it must be so in its origin, or *vice versa*, for if the law be allowed to hold good one way it must the other.

If Mr. Cattlin will do me the favour to re-read my remarks, he will see that the whole tenor of the paper is of an opposite character to that which he has stated, and that instead of having "alluded to the weaker acids found in the cavities of the teeth as the *cause* of caries," I have all along endeavoured to show that such an effect is *impossible*. The whole purport of my paper was to work out the definition given by Mr. Tomes, namely, to show the vital nature and condition of the elements of the tooth. To define its relationship with the cutaneous system: to trace out the probable causes of death, and the nature of the subsequent decomposition of the dentine: to show the natural death and change by *eremacausis*: to point out the subsequent change which takes place on the softening of the dentine, and showing the source of the acid which converts it into a *progressive* destroyer of the tooth. This latter distinction is needed, because although we *cannot prevent* the death of certain parts of the tooth under particular circumstances, we *can* always prevent its *chemical destruction*. In relating some of the predisposing causes, it was only with a view to point out the kind of influence we

might be led to expect, and to show how far the action of those acknowledged as such coincided with the views I had advanced. And in viewing the teeth as portions of the skin, and believing them to be similarly and correspondingly affected, we shall be better prepared to investigate the "predisposing" causes, than if we look upon them as separate and isolated bodies less intimately connected.

Yours, &c.,
W. K. BRIDGMAN.

69, St. Giles' Street,
Norwich.

P.S.—Mr. Tomes says he is "led to suspect that the generation of lactic acid will not account for all the effects which are observed in connection with carious teeth." Will Mr. Tomes kindly oblige me by pointing out any such discrepancies? because I have not been able to find any one single phase which may not be accounted for either by the vital decay or its subsequent acid stage; and as the investigation is one of professional concern generally, it is highly desirable that all doubts and objections should be fairly and openly dealt with.

British Journal of Dental Science.

LONDON, JUNE, 1861.

THAT the services of dentists, as compared with those rendered by medical men, meet with an equal pecuniary acknowledgment, does not admit of dispute. That the former, as a body, do not command an equal social position with the latter, is clearly traceable to the superior educational acquirements of medical practitioners. Many isolated examples may be cited in favour of equality of position, but these prove what the dentist might be had he undergone the proper training; and these exceptions to the general condition of the dental profession are landmarks showing how great an improvement is within our reach, and point out to us the nature of the duty that devolves upon those to whom the custody of the rising generation of practitioners is intrusted. The success that marks the career of the more highly educated is an undeniable proof that the public not only appreciate professional attainments, but select, when selection is possible, those whose position as educated dental surgeons is undisputed. With a clear appreciation of the necessity, ably pointed out by the more distinguished members of the dental profession, the College of Surgeons, in framing the dental curriculum, have laid

down rules, the observance of which will ensure to the public a class of practitioners whose knowledge will entitle them to confidence and a proper social status.

It has been stated that this curriculum is excessive in its requirements, that it necessitates too great an expenditure of money and of time, and favour is sought and support is solicited by appealing to those whose circumstances do not admit of compliance with its conditions.

Conformity to the curriculum is not required of those who entered upon the study of dental surgery, or of those who commenced practice, prior to September, 1859; hence no retrospective hardship is imposed.

In respect to the expenditure of money and of time, the curriculum does not enforce higher conditions than are required of the medical student, and seeing that the remuneration of the dental does not fall below that of the general surgeon, there is no reason why the educational requirements should be lower in the one than in the other case.

Inferiority of education involves inferiority of position and of professional usefulness, and, if admitted by the College of Surgeons, would permanently stamp the

dental surgeon with the low status from which, under the existing regulations, he is gradually and surely rising.

Of those who would select dental surgery as a profession, no doubt there are many whose friends are unable to furnish them with the requisite means to comply with the dental curriculum, but their position is not singular. The solicitor's clerk would prefer to be a solicitor, the medical man's dispenser would prefer to be a qualified practitioner; but in the absence of the necessary means, they must be content with the position in which their lot is cast. And so it must be in respect to the dental profession. The various posts in life must be filled, whether they be high or low, and our individual necessities and our capability to meet them will mark for each of us our position in the social scale. Despite all clamour about liberality, equality, and independence, there will be masters and workmen, there will be dental surgeons and dental artisans. Superiority of education will make itself felt, be the subject treated what it may. The term "gentlemanly," as applied to different callings, is fast falling into disuse. Men of education are daily accepting occupations which formerly were deemed beneath them, and by doing so have raised those occupations to a position which could have been attained by no other means. There are those who, destitute of education, affect to despise educational training, and would bring others down to their own level, but they argue rather to suit their own convenience or personal feelings than from any deeply felt conviction. Where shall we find the educated man who regrets the time or money spent in education, or who would barter his knowledge for thrice the cost, were the transfer possible?

It behoves those practitioners who have sons destined to follow in their footsteps, or those who have dental students committed to their charge, to look well to these matters. Now that dental surgery has been fairly placed as a recognised profession, its ranks will be efficiently

filled, and those whose acquirements fall below the recognised standard will fail to maintain the position their predecessors readily secured. Plausible reasons may be adduced for incompetency, and in exceptional cases tact may cover ignorance, but it is not with exceptional cases that we are concerned. The advertiser may in some instances succeed, but every year his isolation from the rank of a professional man becomes more strongly marked, and adds to the cost of his questional notoriety. The position of the advertiser has, however, been sufficiently defined in recent articles, and we need only add that properly educated professional men, whatever their calling, cannot accept the personal degradation which associates itself with the use of advertisements.

Among the opponents to sound progress it has not been unusual to exaggerate the requirements of the dental curriculum, and in the place of four to state seven years as the period of pupillage. This is done by adding to instead of including in the four years of professional study the three years of attendance to mechanical dentistry. The curriculum requires that the student should devote four years to the acquirement of professional knowledge, and within this period all the conditions enjoined by the College of Surgeons may be fulfilled. The lectures and hospital practice may be extended over the whole period, or they may be condensed into the last two years. In the one case a certain number of hours may be set apart in each day for mechanical dentistry, in the other case the first two years of pupillage may be wholly devoted to the mechanical department, giving a more limited attendance during the third year. Where preference is possible, we should recommend the former course; and should the student's means allow, the devotion of five years to study will not be unattended with more than compensating advantages.

The aim of a professional examination is to secure a fair competency, acquirements below which would not entitle the practi-

tioner to confidence, and above which could be attained by the few only. The standard is regulated by the amount of knowledge that can be acquired by a student of average ability and average powers of application in the period allotted to study, and the length of that period is determined by experience. But this is not all. The manner in which study is conducted exercises a very important influence on the mental character of the student, and the character of the teachers and of the institution are scarcely less important in their effects. To guard against the narrowing influence of a special school, the dental student is thrown into a general medical school, there to acquire his knowledge of medicine

and surgery, leaving the special school to impart special knowledge only. These manifest advantages cannot be secured without expense. Still, the educational cost will not exceed that which has frequently been incurred by private pupilage.

For instance, at the Middlesex Hospital Medical College the fee for the dental student is forty guineas, at the London School of Dental Surgery the fee is thirty guineas, making a total of seventy guineas for public instruction. The fee for examination is ten guineas. And we have to add a further sum for private instruction in mechanical dentistry. The amount of this will be determined by private arrangement, and may be covered by a very moderate sum.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

To the Editor of the 'British Journal of Dental Science.'

SIR,—My attention has been directed to a paragraph in the last number of the 'British Journal of Dental Science,' having reference to the appointment of a dentist to Her Majesty's Hospital, at Fort Pitt, Chatham.

It was perfectly unnecessary for the writer to seek information from private sources respecting business connected with the public service. The Director General of the Army Medical Department, or the principal medical officer at Fort Pitt, would have supplied it, and the misstatement would have been avoided.

By the insertion of this you will oblige
THE DENTIST TO THE HOSPITAL.

Maidstone;
June 5th, 1861.

[The absolute correctness of our information renders it quite unnecessary that we should trouble the Director General of the Army Medical Department to affirm the negative published in the last number of this Journal. We again state that no

dental appointment has been made at Fort Pitt—that a dental officer has not been appointed to that hospital. If we are wrong, our error will be readily proved by "The Dentist to the Hospital" publishing in this or any other journal the official document which must have been addressed to him by the head of the Medical Department, and under which he holds his appointment as Dentist to Fort Pitt Hospital. The production of the official document conferring the appointment in the absence of any notification of the appointment in the government organ—the Gazette—is the only evidence that can be accepted in favour of the assertion that a dental appointment has been made at a government hospital. It is for those who assert a position to prove by positive evidence the correctness of their statements, should they be called in question. It remains for "The Dentist to the Hospital" to show that he has received an appointment in Her Majesty's service.—ED. 'B. J. D. S.']

To the Editor of the 'British Journal of Dental Science.'

SIR,—After carefully reading Mr. Bridgman's paper, when it appeared in the columns of your journal, I arrived at the conclusion that I pretty clearly understood, in the main, the theory he propounded to explain, the nature and process of caries of the teeth; but his letter in your last number now leaves me in a little doubt as to what his theory really is. I think, also, he does not clearly comprehend my views on the same subject, which I am not surprised at, as they were brought before the Odontological Society in a paper, unavoidably, written at a very short notice. I shall not, therefore, attempt here to combat Mr. Bridgman's views, which are entitled to our best consideration, nor shall I endeavour to render my own more comprehensible, as I hope before long to have the opportunity for so doing in another place.

With regard to the experiments by which I believe my views are to some extent supported, I must say a word—as Mr. Bridgman, a little hastily, I think, dismisses them from consideration as experiments than which “nothing could be more fallacious,” and that “any deductions made from such imperfect data, must, of necessity, be entirely without value.”

The chief ground of Mr. Bridgman's objections appears to be, that I employed for the experiments teeth that had already undergone the principal changes peculiar to decay, and that the only precaution I adopted was to remove the carious and softened dentine. I admit, I purposely selected those portions of teeth that had undergone some of the changes that take place prior to actual disintegration or decay, because in such teeth only could I expect to obtain accurate representations of those changes which occur to these organs in the mouth. What those changes in the tissues of a tooth actually are which predispose it to take on caries, as yet we know not, and, perhaps, never shall know, yet they afford, I believe, a fruitful field for inquiry, and one to which

I hope to be able for some time to devote my attention. Had I taken for my experiments portions of the structures of sound teeth, I should have felt far less confidence in the results. Suppose a person were desirous of investigating, experimentally, the changes that go on in bone, when attacked by that formidable disease called caries, by subjecting a portion of bone, in or out of the body, to certain conditions likely to produce such changes, which, by the way, in some particulars resemble those which occur in the teeth in the disease bearing the same name—would he select for his experiments either a piece of healthy or a piece of necrosed bone? on the contrary, I imagine he would obtain a portion from a bone in which those changes had already taken place, which render this structure so liable to the disease in question—a portion of bone already enlarged by infiltration, with what is probably tuberculous matter—and use that for his experiments.

The short, and, I admit, imperfect view of this disease, contained in my paper, did not pretend to explain what those prior changes are, those errors of nutrition, perhaps, which predispose a tooth to take on caries, and which conditions may, and do, very probably, frequently exist without the disease actually occurring, from the absence of certain circumstances to call it into existence—as to take the case of caries in bone, you have in many strumous subjects the enlarged articular extremities, and the deposits before mentioned existing in them and other cancellous portions of the bones, yet, fortunately, only a small proportion of these individuals suffer from actual caries. I agree more fully with the views expressed by Mr. Cattlin, at the discussion on Mr. Bridgman's paper, than from his remarks I think that gentleman is aware of, when he stated that “he ventured to call the attention of the Society to the constitutional causes of caries, because we are too apt to neglect them, and to attribute the evil under discussion entirely to local action.”

I am, Sir, yours, &c.,

ALFRED COLEMAN.

3, Finsbury Square.

Literary Notices and Selections.

ON THE SUPPOSED INFLUENCE OF THE CEMENTUM IN SUSTAINING THE VITALITY OF TRANSPLANTED TEETH.

By CHARLES VASEY, Esq., L.F.P.S.
Glasgow.

(From 'The Lancet,' June 8th, 1861.)

THE preparations in the Hunterian Museum that illustrate John Hunter's experiments of transplanting the teeth are of the greatest interest, as leading to a scientific solution of a result, hitherto unexplained, arising from certain accidental injuries of the teeth, and operations performed on them.

Professor Owen says, "In growing teeth, with fangs not fully formed, the cement is so thin that the Purkinian cells are not visible; it looks like a fine membrane, and has been described as the periosteum of the fangs; but it increases in thickness with the age of the tooth, and is the seat and origin of what are called exostoses of the fang, which are wholly composed of it. These growths are subject to the formation of abscess and all the other morbid actions of true bone."

"It is the presence of this osseous substance which renders intelligible many well-known experiments of which human teeth have been the subjects, such as their transplantation and adhesion into the combs of cocks, and the establishment of a vascular connexion between the tooth and the comb. The appearances which the Hunterian specimens of these experiments present, and of the reality of which Professor Müller satisfied himself during his visit to London, are no longer perplexing, now that we know that the surface of the tooth in contact with, and adhering to, the vascular comb, is composed of a well-organized tissue, closely resembling bone."

Now, if the union of transplanted teeth depends on the presence of the cementum, we can scarcely be prepared for the account of Hunter's experiments given in the catalogue of the College of Surgeons, or in Hunter's work on the teeth, wherein he says, "I may here just remark, that this experiment is not generally attended with

success; I succeeded but once out of a great number of trials." It cannot be for a moment supposed that Hunter could overlook a difference in the mode of conducting his experiments that would account for his non-success in so many cases. We must therefore look for the success of the one case to some principle not recognised by Hunter, and this, I believe, will not prove to be the presence of the cementum.

Before I had the opportunity of examining the Hunterian preparations, I felt certain that the tooth in the one successful case was a young tooth—that is, a tooth in which the root is not fully formed, the pulp-cavity large, and the formative pulp present; and such I really found it to be. Yet such a tooth, as Professor Owen says, has little or no cementum, that substance being like a thin membrane in growing teeth. The very reverse is found in the preparation in the museum mentioned by Hunter as unsuccessful: the tooth in it is more fully formed, and the cementum proportionately greater; yet union has not taken place. (Figs. 1 and 2.)

Fig. 1.



Fig. 2.

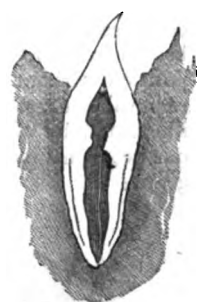


Fig. 1. The tooth of the Hunterian preparation, No. 47; the successful case of transplantation.

Fig. 2. The tooth of the Hunterian preparation, No. 49; the unsuccessful case of transplantation.

(Sketched from the Hunterian preparations by permission of the Council of the Royal College of Surgeons.)

Careful consideration of the whole subject of transplantation of the teeth, and considerable practical experience of cases of reunion, have thoroughly convinced me that the successful cases depend on the presence of the two formative organs namely, the

internal or dentinal pulp, and the external or cemental pulp; and that in all cases in which these are not present, or in which ossification is nearly complete, successful results are not to be anticipated.

By this reading of Hunter's experiments we can understand necrosis as a result of slight injuries to the teeth, and shall also be able to avoid such a result in operations performed on them for the purpose of improving their relative position.

Necrosis, as a result of slight injuries to the teeth, is of every-day occurrence, and is brought about in the following manner. After a blow from a fall or otherwise, the tooth loses its vitality, and gradually becomes of a dark colour. In many cases the gum and alveolar process are absorbed, when the tooth loosens and has to be removed. This absorption occasionally commences at the apex of the fang, and the tooth seems to be retained in its place for a time by a band of gum covering only a portion of the root of the tooth.

Now, if the cementum were sufficient to support the vitality of a tooth, this unfavorable termination of a slight injury would not so frequently occur. Such cases, I believe, are best explained on the principle that ossification of the pulp having progressed to that stage in which the aperture leading to the pulp-cavity is at its minimum, the vessels being ruptured by the force applied, recede, and cannot reunite.

This view of the subject is also proved conversely by the fact, that a tooth may be entirely removed from its original position without detriment, provided its removal be effected gradually. This is well illustrated by the following case, which is one out of many similar to it that might be given:

Fig. 3.



Fig. 3. Drawing from the mouth of a boy who lost the central incisors from a fall.

Amongst the operations that have been recommended and performed on the teeth,

Fig. 4.



Fig. 4 shows the space nearly closed, the lateral incisors having been drawn together by elastic cord nearly into the position previously occupied by the central incisors.

there is one almost identical to transplantation, and depends for its success on the same principles. This operation is the seizing a misplaced tooth with the forceps, and at once turning it into its proper position; the tooth is then secured by ligature, or some mechanical contrivance previously prepared for the purpose. This proceeding has been recommended in cases of torsion, such as are represented by Fig. 5.

Fig. 5.



Such an operation should never be performed when the development of the tooth has proceeded beyond a certain stage. And as there are no physical signs of the stage of development in any one individual tooth, I consider it to be questionable practice ever to resort to it. A slight mechanical contrivance, similar to the one used to retain the tooth in its new position, would prove sufficient to move it gradually if an elastic ligature be used. The object sought would also be gained in nearly the same space of time as is required for the refixing of the tooth when forcibly turned.

Faith in the power of the cementum to support the vitality of the teeth, I believe to have led to errors in our practice. A correct reading of Hunter's experiments in the transplanting of teeth will suggest to every dentist such modifications as will lead to a safer and more uniform result.

Cavendish Place, Cavendish Square;
1861.

Dental News and Critical Reports.

THE ODONTOLOGICAL SOCIETY OF LONDON.

MONDAY EVENING, *June 3d*, 1861.

The PRESIDENT in the chair.

The minutes of the last meeting having been read and confirmed,

The PRESIDENT said,—I am sorry I cannot announce any addition to our library. There are two or three contributions to the museum by members of the Society. We have here three lower molar teeth, each with three fangs, also a large piece of salivary calculus, presented by Mr. Edward Parkinson. We have likewise some very singular teeth presented by Mr. Charles James Fox, who states that he extracted them from an infant six weeks old. It is rather a peculiar case. Mr. Laurie, of Mortimer Street, has presented a specimen of Allen's continuous gum, the counterpart of a piece worn by Dr. Allen, of 30, Bond Street, New York.

Mr. TOMES.—Mr. President, may I ask you to allow me to appear before this Society in the capacity of a beggar? I have promised the Secretary to prepare a paper to be read before the Society next session, the subject of which will be the physical condition presented by the various materials used for plugging teeth—amalgams, gold; and my mode of proceeding will be to force these materials into apertures in a slip of ivory, and then examine them after they have been thoroughly consolidated, whether by the means of pressure, as in gold, or of time, as in the case of amalgam. I shall be very much obliged to any gentleman who uses any peculiar form of amalgam, or any peculiar form of gold, or, in fact, any material which he believes to be better than those which are in general use, if he will favour me with a small portion of it in

order that I may give an account of that in common with other materials that are at present available. (Applause.)

Mr. ARNOLD ROGERS.—I beg, sir, just to remark in regard to the proposition of Mr. Tomes, that it is not under any circumstances desired to criticise the capabilities of gentlemen upon the modes they employ. This is entirely an affair of science. I am quite satisfied that Mr. Tomes's intention is simply to endeavour in any way he possibly can to improve on the present modes of plugging, excellent as some of them may be; though, when under the microscope, we find the materials present such irregularities and imperfections, at the base more especially, that we should be very glad if we could get something better. Whether that can be done or not, I am quite satisfied that it is Mr. Tomes's intention that no reflection should be made upon any gentlemen who favour the Society with their experiments on this subject.

Mr. TOMES.—I am much obliged to Mr. Rogers for his observations upon my statement. These investigations were set about some time ago, in reference to amalgam plugs, and I found by experimenting in the way I alluded to just now, that it was perfectly impossible to get anything like a thoroughly solid amalgam plug. You cannot by ordinary means force an amalgam perfectly into a right angle. Moreover, in the course of consolidation the mass almost always contracts more or less, and separates itself from one side of the cavity. I will mention another circumstance in connection with amalgams; it is this, that supposing a very minute fissure is extended from a cavity into the substance of the tooth, and the amalgam is forced into the opening, so that we believe the fissure to be perfectly filled, in nine cases out of ten the appearance will be deceptive. The pressure employed will have forced mercury only into the fissure. Finding that such results occurred where the plug was intro-

duced under circumstances more favorable than could be commanded when the plug is introduced into a tooth in the mouth of a patient—finding that under those very favorable circumstances solidity could not be insured—I determined to enter upon a series of experiments upon a wider and larger scale than I had hitherto attempted. (Applause.)

Mr. ARNOLD ROGERS.—My motive was really, sir, in rising just now to express a hope that every gentleman will try his best to produce the most perfect plug, and then we should see by the microscope whether there is any really perfect mode.

The PRESIDENT.—I have now to announce the names of gentlemen who are candidates for the membership of the Society. In the first place, I give you the name of Professor Owen, F.R.S., recommended by the President and Council for election as an honorary member. (Applause.)

The following gentlemen were also proposed for membership of the Society.—Resident: Edward M. Tweed, 11, Brook Street, Grosvenor Square; Francis H. Balkwill, Canonbury, Islington. Non-resident: Mr. William Pearce, 3, Trinity Road, New Town Bristol; William Hunt, Yeovil, Somersetshire.

Mr. TRUMAN then read his paper.

On the Necessity of Plasticity in Mechanical Dentistry.

Mr. President and Gentlemen,—The subject of the present paper has been now long before the profession, and has taken several forms; which is the best, or whether the best is yet known, remains for us to determine; but that plastic dentistry, in some form, will be admitted now to be essential, I feel we shall all agree. In laying my subject before you, I shall not endeavour to give a detailed account of the various means of attaining plasticity, as this would be useless and tedious,—all that I could tell, you know; I shall simply point out the most prominent methods, and endeavour to show the various steps which have been taken, and give them, as far as I am able, in the order in which they appeared in this country. I mean, by plastic dentistry, an arrangement by which the mouth may be fitted with artificial teeth, through or by the direct means of plastic materials, either permanently retained or afterwards replaced by others of a more durable nature.

On the 11th of May, 1791, appeared in

England the first use of a plastic material for the construction of artificial dentures. M. de Chemant, as you all know, proposed mineral paste moulded to a plaster model, and afterwards, when dry, carved to imitate teeth, and then vitrified. The property of clay to shrink in baking was, however, fatal, or here would have ended our labours, for in a very short time all that we require this substance would have fulfilled; but this one fault has cost us seventy years labour, and is not fully overcome yet. Mineral paste is, and I think always will be, one of the most useful and beautiful materials we have, and we should be wanting in gratitude to M. de Chemant not to award him our acknowledgment and thanks for so valuable an introduction.

The true plastic principle was not, however, at all apparent in M. de Chemant's plans; it was simply making of porcelain what had before been done in bone. So I shall not occupy more time with this part of my subject at present.

In 1845, Mr. Tomes led us into another channel of thought, by his most ingenious application of machinery to effect with greater certainty the fitting of bone to the model. Ivory was then one of our best materials; its lightness and congeniality would give the greatest known comfort, if the base was well fitted. This Mr. Tomes sought to do, without the liability to failure always attendant on manual dexterity, and thus surmount the difficulties arising from the non-plastic nature of this material.

I now arrive at what I believe to be the first introduction of the plastic principle.

In 1848, the importation of gutta percha into this country had led to its use for many purposes, and to a series of experiments by myself, with the view of rendering its manifold peculiarities, and especially its plasticity, conducive to the advancement of mechanical dentistry. These experiments have occupied myself and others ever since, nor are they now concluded; but the results thus far it is my intention to lay before you to-night. I shall therefore resume this part of my subject in its proper place.

August, 1849, Mr. Harrington took out a patent for the use of tortoiseshell. He endeavoured to overcome the great difficulty of the bite by using temporary hollow sets filled with wax, instead of the usual modelling-pans, and then, by a very clever contrivance, registering the dimensions re-

quisite in the finished structures, which were to be mineral sets made entire, and fitted on a base of tortoiseshell made plastic by heat, and, whilst in that state, forcibly compressed on to the metal model. This substance not being plastic below boiling point, the whole plasticity of the plan depended on the wax filling the temporary sets, and the capability of moulding the shell to the model.

1850 produced a suggestion from Mr. Dimsdale to construct the gold coating by means of dies. In this plan we have a further slight development of the plastic principle, after the use of wax to raise the model or predicator. *Predicator*—I propose the word predicator as a name for that wax or other plastic structure raised, as in vulcanite, to predicate or predetermine the size, shape, and absolute conformation required by the mouth in the finished structure. He fitted this to the mouth, and then proceeded to cast plaster forms for the purpose of striking up his hollow metal gums. Here plasticity is confined to the wax gum, but it is the first use of plaster casts from the predicator in this country of which I have any knowledge.

1853, Mr. Laurie introduced the continuous gum, mineral paste filling the interstices between the teeth and plate, which, on being hardened by fire, renders the whole structure one piece. In this we have our old plastic material beautifully used; its one fault, shrinkage, thus far entirely overcome, but its plastic property only conducive to beauty.

Mr. Loomis, in 1854, sought to make whole dentures on M. de Chemant's plan, and to rectify the shrinkage by cutting the plaster model through transversely, and again uniting the halves with a piece of wood of the desired thickness glued between; and this operation being repeated longitudinally, would give an increase both in the length and breadth of the model.

These were quickly followed by vulcanite and metal alloys and tin, the plans of using which are essentially the same: to which the priority should be given I do not know. In each of these plans, a predicator is reared on the model in wax, with the teeth that are to be used in the finished case; a plaster matrix produced, and filled either by casting in metal or packing in vulcanite; lastly, various imitations of ivory in 1859, and colodion in 1860, all used much after the same fashion, but all fitted to the best model that the operator could procure.

These bring us down to the present time; and I think I have enumerated all the plastic plans proposed: from which we see that—

Up to the year 1848, the use of plastic materials for this purpose was practically unknown. Experiments had been made, but without practical results; in fact, so totally unlike anything then in use was the plastic system, that it required some courage to introduce, take up, or use materials so contrary to received usage. I remember the late Mr. Claudius Ash, on my first mentioning to him my intention of using gutta-percha, asking me if I intended it merely as a means of publicity, as it surely could not answer in practice. The employment of gutta percha has been the means of introducing plastic materials into dental practice, and may yet itself alone in many cases be found the best substance for the purpose, under proper management. How to treat substances so entirely new could only be arrived at by time and constant perseverance.

I promised, in a pamphlet published in 1849, to give the profession the results of my working, and I now propose to do so.

The great aim of the dentist in making artificial dentures is to render them useful as aids in mastication, and therefore to that point I will at present confine my observations, as the perfect comfortable fitting of the base to the gum must be obtained before that great object can be achieved.

The first step, after the mouth is properly prepared for artificial teeth, is to procure a good model. This I think, in many cases, an utter impossibility, unless you remove sound teeth—useful teeth—teeth that, but for artificial aids, you would plug with the greatest care if they were decayed, in the hope of retaining them—for such would be good practice. I am sure you will go with me in repudiating any such interference. What, then, is to be done? The best model that can be got must be taken; and the question is, how? Many substances of a plastic nature have been proposed to model with—wax; composition of wax and mastic; other compositions; gutta-percha, alone or prepared; plaster: which is the best, depends on the case; but in the irregular mouths, among that forest of irregular teeth, none can do it perfectly. In how few cases a near approach can be obtained, you all know. In this lies the great difficulty of fitting artificial pieces

that are to be useful in mastication. The best workman can only fit his model; and if that is not like the mouth, what is to rectify the difference? Sometimes, the more perfect the fit to the model, the worse the fit to the mouth, as the imperfections of the former are too closely copied to allow comfort in the latter. I have only one remedy to propose to you against a bad model; and that is, to use a substance which can be fitted direct to the mouth itself, either in the construction of a perfect predicator or as the base of the permanent artificial teeth: but of that more hereafter.

In simple cases, without much loss of structure, with short remaining teeth and a close bite, the old gold plate modified by modern improvements is still the best.

For front teeth, pieces of two or three teeth, if not pivoted, when the remaining teeth are good and no back ones lost, unless the teeth are very long, I prefer a modification of the old French plan without a plate; and these are almost the only cases in which plasticity is not wanted; so, not to occupy your time too long, I shall say no more about them. For masticating teeth placed artificially, especially in the lower jaw, if we would have our patients eat in comfort, plasticity must be used in one form or other; either we must, as in the case of vulcanite, horn, tin, and shell, use it as a means for defining and arranging the form and size of the piece, or we must, as in gutta-percha, apply it to the finishing and fitting of it finally in the mouth itself. Wax, as a medium for mounting teeth preparatory to the fixing, was in use before the introduction of the plastic principle; but its real value as a plastic medium, except in modelling, was not understood. It is now through this substance that the system is carried out, and it is by its instrumentality that we are now able to mould non-plastic but more durable materials for our purpose, and thus arrive at greater exactness with much less skill and trouble. I think, in all the plastic systems, wax is chosen as the material with which to raise the predicator, or temporary structure. Other substances could be employed, but wax is the best; or it may be mixed with other matters to harden it, and so enable us to get a better finish: for I need not say, that the more perfect the wax is, the less is left to be done afterwards to the hard or durable substance by which it is replaced. This, in fact, is in all cases, except when gutta-percha is used, or electro-gilding, as described by me in the

specification of my patent of 1848, the stage in which plasticity is alone obtained. In many cases, it is, as now used in vulcanite, sufficient, especially if you can get a good model, as by it the after form of the piece is determined, the arrangement and antagonization of the teeth definitely fixed; and as these are the vital points on which depend the whole success of the operation, it follows that, with a good model to give the perfect shape of the base, plasticity, by facilitating the arrangement of the other and more difficult points, enables us to arrive at much greater perfection than was possible without, and is therefore a very great advantage.

Now, let us suppose a case. The upper teeth are all gone—the lower front teeth alone remain—you take models of the mouth, and arrange the bite in the usual manner; the model for the upper may be obtained by any of the materials proposed—some prefer plaster, but all admit that it is highly necessary for the model to be a good one, especially if no springs are to be used. Much ingenuity has been expended in the hope to get a good model of these edentulous upper jaws, which are the easiest of all to model; but even in them it is impossible to get two of the same mouth exactly alike, which I take to be positive proof that neither is correct. But we will suppose, to save time, that we have fortunately got a good model.

For such an upper set, vulcanite is peculiarly adapted: used plastic, as we all understand, and hardened by heat, a perfect, steady, firm fit may be obtained with the greatest facility.

The teeth are first mounted on wax to the right height, size, shape, and position. Thus far we have a structure entirely plastic, which can be arranged to the bite perfectly and most easily. The shape so given being retained in the finished case, the temporary piece may be fitted on a metal plate and tried in the mouth, and regulated to it before being plastered up: for when a non-plastic substance is to be used permanently, every advantage should be taken of mobility whilst it is present. I sometimes carry this principle so far as to allow the temporary piece to be worn and used for some days before stereotyping, as we may call it, by producing the vulcanite set from it in the usual manner. If we wish to do this, of course wax will not answer; use gutta-percha instead, and have all the teeth mounted on a skeleton metal frame, which will keep them in their proper place, and

afterwards be imbedded with them in the vulcanite and impart very great additional strength. All the peculiarities of the mouth can be complied with, the form of the arch arranged to please the eye and benefit the form of the face: a little more bulk is added here, a little less used there; this tooth is a little too much in, that too much out. All these defects and any others are easily rectified; friends are consulted, the most satisfactory conclusion is arrived at, and then the piece unalterably fixed, without any chance or guess work, or without re-making, unless from accident—duplicate permanent sets may even be obtained exact from one predicator. The vulcanite is light—I mean, of a low specific gravity; the teeth are very firmly set, and, with skill in the making, it is a good and cheap method of replacing the upper. For the lower teeth I think it is better also to use vulcanite than not to use a plastic agent in some form; but I do not think it the best; I prefer gutta-percha, or any other substance which can be moulded to the mouth itself: for in upper cases used without springs, the most important point, after a good fit to the gum, is a good bite; and this can only be attained perfect by having the lower set made of or with a material which will allow, while in a plastic state, that the upper set bite the lower to the right height. This it does, if gutta-percha is in contact with the gum in sufficient thickness to allow the teeth to sink when bitten on. With your permission, therefore, I proceed to describe the making of such a lower set:—Take a strip of gold plate, about the thickness of a new halfpenny, three inches long by half an inch wide. This I bend flat, to fit the inner surface of the lower teeth and gums, it remaining perpendicular; I then solder a bar of copper between the back points, to prevent them opening during the next process of hammering the centre into an external concave surface, the concavity extending back almost to the ends. This is done on a triblet hollowed on the top, into which the gold is hammered; when finished thus far, it will represent half of a tube bent on itself, with the concavity outwards, and of a size that will not go into the centre of the model till it is filed to fit the lower teeth. This is the next step; and in doing this I do not recommend that the fitting be too accurate, but care must be taken that the thickness in front under the tongue behind the front teeth is not too prominent, or it will be complained of in speaking; but it must be enough to insure

perfect strength; which in all artificial pieces is a first principle. Having selected the teeth and cut the lower ends round as though they are to be let into the bone, I mount them in their appointed place with wax, and fit the gold to them as I have before done to the front teeth; next solder strips of gold at the sides in the hollow of the gold semi-tube externally, horizontally, to receive the pins for the teeth, and mount them (but without fitting) as you would on an ordinary gold plate; if necessary, put on the joints for springs, and then cut out all the superfluous plate from between the teeth, and finish the gold by removing all that can be taken away consistently with perfect strength; next, and lastly, solder a strip of open mesh platina gauze into the hollow in front of the gold behind the front teeth, and finish by polishing all the gold convex surface which will be exposed after the gutta-percha is on; great care should be taken to have the teeth not too high, but fitted with a good bite rather too low. Remove the wax, and clean the plaster model thoroughly; fasten on the teeth with cement and silk, or by any other good way. Now put on the gutta-percha, pressing it firmly on the model, to insure density and closeness in all parts, to make it quite solid: on this depends the sweetness. Have too much stuff to begin with, or place another layer under, and again make the whole hot, so that it be just plastic, and then again consolidate it by pressure on the model. Now without touching it, put it, model and all, in water; and let it get cold. To trim and finish, cut away all the superfluous gutta-percha with a hot knife (but not hot enough to burn it, or you will injure the beauty), and smooth the surfaces with the finger dipped in soap and water. Your case is now ready for the mouth; in placing it in which, proceed thus:—

Of course, all care will have been taken that the upper and lower agree in the bite, and that all the points essential in every artificial piece have been well attended to. Have near you a vessel of boiling water, and another of cold; also a spoon or ladle, to remove the piece from the hot water without handling it: I prefer one with the bowl bent at right angles to the handle, and perforated with large holes. Place the piece on the spoon; dip it in the hot water till it is soft enough, but no more; then remove, and passing it through the cold water, place it carefully in the mouth, and press it forward to the

front teeth, to insure its being in its right place. Now put in the top set, and direct the patient to bite steadily, being sure that both pieces antagonize properly. Keep the mouth shut till the gutta-percha cools, or at least solidifies.

Do not handle it, but let the mouth do its own work, and trim it after it is again cold.

The effect of this arrangement will be a perfect fit at the base, and exactly the right height in the bite; for should the height be too much, by gently warming and biting it will go down till it is right; and if, on the contrary, it is too low, another layer can easily be added to the under surface, and the operation repeated, which will bring it right. Also, it is quite certain that the masticating teeth will properly act on each other, as the lower can readily be altered by moving to either side, or by bending till they do: this cannot be done without a plastic base, or, in fact, with vulcanite. These remarks apply also to full under sets.

In small cases of two or three teeth at the side of the lower or upper, all will admit, even the public, that nothing is easier than to replace them with gutta-percha: and I think it will be also admitted by us that there exists great difficulty in these cases without it—almost always the remaining teeth overhang the space between. In these cases the gum is so very narrow, that any uneven pressure is unbearable: therefore, it has been customary to place rests on the remaining teeth, and thus keep the pressure off the gum, and in some instances to put clasps around the teeth to prevent lateral motion. But, with all these contrivances, failures often occur, even with vulcanite, where a plastic material can be well adapted to the model. I will quote a few words from a periodical published a few weeks back, to show what the public thinks on this matter:—

“It is very possible, however, to replace, for all practical purposes, very considerable chasms in the grinders with gutta-percha; and the best of it is, if the dentists will permit me to say so, that it is capable of application by the patient himself. Front teeth cannot be thus replaced; but suppose a man has lost two or three of his back ones, and cannot afford to have them supplied by a dentist, I would advise him to act thus:—Let him take a lump of gutta-percha, about as big as a walnut; warm it thoroughly in boiling water till it is as soft as putty; then putting it into his

mouth, let him bite it well into the gap, and keep his teeth closed till the gutta-percha cools. This will oblige him to shut his mouth for two or three minutes; then let him open it carefully, and take the lump out; he has only to trim it down with his pen-knife, and he will be fitted with an excellent substitute for regular artificial teeth, which will serve him for years. This is no theory, but proved fact; and I can only account for its not being more generally known and realised, by its interference with the regular business of the profession. Forgive, dear reader, my entering into details, but the presence of jagged stumps rather assists this operation than otherwise, for they steady the gutta-percha superstructure.”

And which of us can deny the truth of these remarks? Not I; for during the last twelve years I have repeatedly seen such pieces, made by the patients themselves, replacing others made in the best manner on the old plan. An eminent counsellor told me, the other day, that he had done so; and one of the highest functionaries of the present time did it for himself ten years ago, and has used them ever since. Of course, teeth should be placed in such pieces; and for so doing, it is only necessary to mount two or more teeth on a bit of plate, and imbed the whole in gutta-percha on the model; then trim as usual; and after again warming, place the piece in the mouth, and allow it to cool: it will, if well done, be quite serviceable as long as the mouth remains unaltered. I have seen such a case, after it had been during five years and ten months in the mouth without removal, perfectly good, the mouth quite healthy, and on removal it would have required a close observer to find that an artificial piece had been used.

The irregularities of the remaining teeth, as I before said, form the greatest obstacle in fixing artificial teeth; and unless we remove them, I know no better method of effectually getting over the difficulty than to use, as I have shown, a plastic material, such as gutta-percha, and mould it directly to the mouth, as in that method the irregularities are beneficial.

Now let us say a few words about upper-part sets. I will suppose another case:

All the front teeth remain, all the back are gone; what shall we do with it? Make a bone set, or a gold plate? If so, how hold the case steady?—by a chamber, if gold, or by wooden pegs for bone? No; vulcanite is far preferable to either; for it

is lighter, and the back of the front teeth can be well fitted. This will hold the case steady; and with a good model and a well-constructed predicator, it will certainly be better than either bone or gold;—than bone, because it is more durable and easier to make; than gold, because there will be no necessity to put clasps on the canines. I should do it with gutta-percha; but I do not wish to intrude on the notice of the Members of this Society, who are so much better able to teach me than I to instruct them, a matter of mere opinion in practice. Nevertheless, I have only one wish, which is to benefit the wearers of artificial teeth—improve myself and our art, by opening a discussion on what I believe to be the vital point of Mechanical Dentistry; I mean, plasticity.

Whole top sets without springs, I have said, are especially the property of vulcanite; but for part sets of one or two teeth on each side of the upper, and a tooth or so in front, with short bites, in young people, it has not strength enough without great bulk. Perhaps, some will say, strengthen it with metal; I would say, use a gold plate in front, and gutta-percha sides; and as this is a very common case, almost an every-day affair, and will, perhaps, more clearly show what advantage the patient derives from plasticity than any other, I will again, with your permission, state how we proceed to make such a case, a description of the manufacture being the easiest and most intelligible form that I can adopt in treating a mechanical subject.

I think the first thing to be done towards making an artificial piece is to select the teeth, for many reasons; first, to be sure we can get the right; and if not, that our after-work may be arranged for those we can get. This vulcanite has rendered imperative when that material is used, and I would do it in all cases. Excuse my reiterating in so learned a society what I consider the first principles on which these dentures should be formed: I mean, perfect comfort, strength, lightness, neatness, durability, beauty, easy adaptability, and natural effect, with perfect health to the surrounding parts. The first governs all the rest; but even it is useless without durability, and the maintenance of health in the surrounding parts. What was comfort in the old time, bought at the cost of a tooth a year? In all future experiments on this subject, these first principles must none of them be ignored. I do not hope

to live to see perfection in them all achieved in every case, for that would be to see mechanical dentistry perfect. We, in this room, and our Transatlantic brethren, have in our time done much; but it is for a future generation to arrive at perfection, or in reducing dentistry to a science. Still, we cannot hope to improve if we shut our eyes to the fact, that the above points must, in a great measure, be all fulfilled in every case. And let us see now how far I have kept to my own laws in the case before us. First select your teeth, some for the front, perhaps tube teeth with gum, or half teeth with or without gum; let them up into the place they are to occupy on the plaster model. Now let us see how much room we have in the bite for the means to hold the teeth in their place. Perhaps there is not room enough even for a gold plate between the lower front teeth and the upper gum when the mouth is shut; it may be necessary to perforate the plate, to let the lower front teeth through or partly through, or there may be ample space. Now, in the first case, vulcanite could not be used with any hope, as the bulk would keep the back teeth from closing; therefore, I would place all the teeth in their places on the plaster model with wax, except those that were to have nothing between them and the gum, and have them fitted to the lower teeth in the bite; then strike an ordinary gold plate, but very narrow, and cause it to cover the backs of the remaining teeth some distance up, and also the inner surface of the back artificial teeth and wax supports. Now fit that plate to the bite; and if the front lower teeth must go through, let them through. You will now have a skeleton plate, which, if strong enough, would carry your artificial teeth. But it is not strong enough; therefore, it must be made so. Now, it happens by good fortune that the natural teeth stand out of the gum almost at right angles; therefore, in most cases—I will not say in all, but in most—there will be a part of the plate left all along the base of the teeth, forming with that turned on the gum an angle with the concavity inwards. This angle must be filled solid; and thus a triangular bar of metal will be formed, passing behind, but not necessarily touching the remaining teeth; and in only very few instances will it be found requisite to give more strength; but, whatever strength the case requires must be given at this period; but not a particle of superfluous metal should be left, as neatness is another of our principles; as much as is

requisite we must have, and no more. We have thus attended to the teeth, and the plate to hold them in their places; we have now to put them together; and to ensure durability and comfort; one point of which is, that, when finished, the structure should be firm in the mouth. How shall we get this without using clasps to the other teeth? At present, in all cases we cannot do it, but we can in a great many; and when we must do something of the kind, they need neither show nor injure the other teeth. If we have a front tooth or teeth lost, together with some on each side, but not the back ones, of course they will not be required at all, as the fit of the plastic material in the back openings will be enough to keep them all steady; but if it is requisite, be sure to fit the opening between the canine and lateral, or canine and bicuspid, or any other little interstice that may exist about that part of the mouth, very accurately, even placing a small portion of gold to project between the teeth from behind; this in all cases will be found quite enough. Now put on the side pieces of gold to support the pins for the back teeth; if pin teeth are used, as before described, when using my semi-tube for the lower; if half teeth, let them be soldered in the ordinary manner to the gold plate; replace the wax with gutta percha, and you have a piece that is the smallest, lightest, strongest, most durable, most comfortable, and least injurious that I can conceive, constructed upon what I term the true plastic principle, because all the materials are treated as though they were plastic even though they are not so, and a piece is produced which, in the mouth, is to all practical purposes quite plastic; where defects existed in the model, the gutta percha will rectify, and the fit is as even as though the whole arrangement had been fitted in a plastic condition.

It may be said, at least durability cannot be ensured if gutta percha is used, and that no case made of gold can be so light as one made in vulcanite or bone; and it may also occur to some to ask, Are these very small cases less detrimental to the remaining teeth and soft parts of the mouth? I will begin by answering the last question first.

My experience shows they are less injurious, because they are lighter, and, from their accuracy of fit, do not place an undue strain on any one part; the remaining teeth are left quite free, and the mucous membrane of the palate uncovered; there is no accumulation of effete epithelial cells or

lodgment of food. And I would ask, in return, what is the use of the plate in such cases, if it is not required for strength?—and that it is not, I think I have fully demonstrated; and as comfort without it is immeasurably increased, I hope you will all give this plan a fair trial before you again put into the mouth a single grain of superfluous material. Next, to take the same reverse order, are they lighter? Make two cases, the one upon my plan, the other on any other, and weigh them, both having the necessary amount of strength; the result will answer the question in my favour if my directions have been fully carried out.

And now for that great question, the durability and cleanliness of gutta percha. I have never seen gutta percha that has become decayed whilst under water, and therefore none that became so by being worn in the mouth. I have repeatedly seen gutta-percha pieces that were very rough and dirty looking and very offensive—even specimens of my own preparing years gone by—but I never saw it decayed in the mouth. If worn, however, for some time without cleaning, and put away in a box dry and covered with grease, on being again heated the gutta percha becomes sticky and like birdlime, and should, of course, be renewed; but if kept in water while out of the mouth, I believe the gutta percha to be indestructible. The roughening or dirty appearance, and the offensiveness, are caused by its porosity; and this only happens when it is badly treated, or, in other words, not understood. Great force should be used to put it on the pieces, to consolidate it and close the pores; this I now do under pressure. The gutta percha being quite pure and properly prepared to begin with, and not boiled, but merely softened—or, if the colour is not of so much consequence, softened by dry heat—and after it is finished in the mouth, the surfaces again dried, and a thin coat of amber varnish or collodion brushed over them, neither roughening nor offensiveness will occur. Any trouble to ensure the patient's comfort is not thrown away. I have used it now nearly thirteen years constantly in thousands of cases, and latterly with undeviating success, because I have strictly attended to the rules herein laid down, and which nothing but time could develop. To put on gutta percha under pressure, I proceed just as we should to make a vulcanite set as far as the models are concerned; but instead of putting the teeth into the mould before packing, I put

in the finished gold piece with teeth all fastened on, and I use about two or three times more gutta-percha than the space will hold. Having all soft and warm, I put the moulds in the iron cases together, and force them home under a strong screw press, very slowly, but with great force; This will, of course, leave the bite too high—just what I require; for, as I said before, the mouth should regulate that, which of course it does the last thing.

I allow the gutta percha to get quite cold under pressure, and then trim off the surplus with hot knives. If this process has been used, and the material good, it will be found quite solid; and with cleanly use, and good brushing with pumice-powder, I know nothing wear better. I know a case, now, that has been constantly used, untouched, except replacing a broken tooth, for eleven years. I need say no more about durability, but I will again point out briefly the causes of disappointment in the use of gutta percha.

1st. Boiling it is most pernicious; it opens the pores, and leaves it a sponge.

2d. Fingering and manipulating it in the mouth unnecessarily. The mouth will put it in shape, if left to itself, far better than we can. And,

3d. Hurrying it. If it is taken from the mouth before it has sufficient solidity to enable it to keep its shape, it is in danger of being altered before it is cold. I would therefore say, put it on by pressure, trim it carefully, warm it sufficiently—no more; place it in the mouth correctly and carefully; allow it to remain steadily pressed by the antagonising teeth, not the fingers, till it is cool enough to remove without danger; place it in a vessel of cold water till it is quite set; trim it again to exactly what it should be; smooth the surfaces with warmth and your fingers, or a burnisher dipped in soap and water; wash it quite clean; pass it quickly through hot water, just to slightly soften the surface; place it in the mouth, and there let it remain; in an hour the patient may eat his dinner with perfect comfort, and if his mouth does not alter, certainly the artificial teeth will not. One word more. I have said, I know a case that has stood perfectly eleven years. I think, with all our philanthropy, that we should not like all our cases to endure so long, especially as the facility for adding other teeth, afterwards lost, without making new sets, or even leaving a visible patch, or rendering the fit or particle less perfect than it was originally, must make this plan

greatly less conducive to profit. I therefore say, fortunately the mouth alters if the case does not, and the comfort derived by the patient by a refit and new gutta percha amply repairs this objection. I have a patient, known to many of you, who delights in the sensation of biting the piece into its place so much, that he constantly has the surface renewed to gratify this propensity; and really the facility with which this operation is performed is so great that it becomes a source of great profit. I can put on the new gutta percha, after the models are ready, in a few minutes; and, as you know, they can be prepared in less than one hour.

If a tooth breaks in a vulcanite set, it takes more time to repair it. I would say more about vulcanite, as I think it a process in its infancy, out of which much may come; the power the workman gains when using vulcanite, or rather, when using the wax in preparing the predicator, enables him so readily to form his piece accurately; mistakes are so easily rectified; the teeth can so readily be moved outwards or inwards to suit the bite; the pins not having to be fixed in holes drilled in gold and soldered, do not so much depend on the skill of the workman; and the true plastic nature of the operation is felt throughout. If gutta percha, alone or vulcanized, is to be superseded, it must be by a plastic material, or one capable of being used through a plastic medium; for those who use vulcanite, or tin, or gutta percha, or any of the plastic plans, would return to the old non-plastic system with regret, having tasted the sweets of plasticity. I, who use gutta percha so much, and thereby retain to myself the power over my work to the very last, could not now be happy without it; it makes the day's work a delight, difficulties a pleasure, and failure my own fault.

But, lately, so much has been written and said about vulcanite, that I felt I should interest you more by complying with a desire that has been often expressed to me to tell my experience in gutta percha; and I do so the more willingly, as it is the only substance yet known plastic in the mouth; and, therefore, carrying my subject—plastic dentistry—to its highest point, I believe, in fact, it is capable but of one improvement—the power of retaining a polished surface. But what material will retain a polished surface in the mouths of careless patients? Not even gold; and in very many cases it leaves nothing to be desired. But I do not plead the cause of any particular substance;

I only now, as at first, maintain that mechanical dentistry cannot be perfect without the plastic principle, in one form or another; and I cannot tell you what amount of pleasure I derive from the knowledge that I have been the humble means of working so great a change; and I am also pleased to be able to add that I have induced the Gutta Percha Company to put up the necessary machinery to produce pure gutta percha for dental purposes. This removes the difficulty of procuring the substance properly prepared, which has always been one of my greatest obstacles; and it would be quite impossible for dentists to do this part of the operation for themselves; it would be easier for them to make their own vulcanite, as in that case the caoutchouc or gutta percha used need not be pure.

I have endeavoured to tell as much as the short time allotted to one paper would allow; but I feel the magnitude of my subject demands both more time and more ability than have fallen to my lot. I hope during the early part of next session it may be followed by other papers from abler hands, not written hurriedly, as mine has been, in the height of the London season, and that it will lead to a thorough investigation into the value of the various plastic materials proposed, and a series of discussions on mechanical dentistry.

MR. TRUMAN continued.—I have here some specimens of the different pieces that I have mentioned, but I forbore to allude to them in the course of my papers, because I thought that the thread of the discourse would be thus broken. Any one who likes to examine them now will find, I think, specimens of everything that I have alluded to. The very small pieces which I have sent round I may say I have used more or less for a very long time. The first thought of those pieces, I find, was in my mind two and twenty years ago, and I find that a piece made by myself two and twenty years ago is in use now. I saw it at the beginning of last week, holding its place and keeping its position and its stability perfect. It was made for a lady who insisted, as I dare say many of you likewise have found in your practice, on having a plate constantly cut and cut and cut, till there was scarcely anything left, and, rather to my annoyance at the time, I lost sight of her for a long time, but periodically since I have seen her, and I saw her the week before last, with the piece now in her mouth; it has kept its place

perfectly, and therefore I believe that the large plates are really not wanted. I cannot see that they are wanted, at all events.

THE PRESIDENT.—Although I see around me many gentlemen who are noted for their skill in mechanical dentistry, I think it is a question whether there are any who can give results of experience in this material, used in the manner recommended by Mr. Truman; for it appears that Mr. Truman has so handled this substance that I doubt whether any gentleman present can say he has used gutta percha in a similar condition. This system appears to me to be perfectly novel in its way; but I shall be very happy if any one who has experience in this matter would give us the results of it. Possibly there may be some here who have studied the subject more than I may have given them credit for.

MR. TOMES.—Mr. President, if you will allow me, I should like to ask Mr. Truman whether, in the use of gutta percha, he has observed that the mucous membrane covered by the gutta percha becomes not uncommonly of a deep-red colour. In the cases I have seen it had an unusually thin covering of epithelium, associated with thickening and a degree of tenderness which may sometimes be found in connection with artificial teeth mounted in other materials, but still I think not so commonly as in cases where gutta percha is used. I do not know that this increased vascularity of the mucous membrane is invariably attended with any great increase of sensibility, but it is a condition that I have observed not very uncommonly as the result of wearing pieces made, not only by myself, but by other practitioners whose skill in the adaptation of the gutta percha could not be questioned.

MR. TRUMAN.—In answer to Mr. Tomes, my experience would go to exactly the contrary. I have repeatedly taken out gutta-percha pieces from the mouth, and sought to find the ordinary result upon the mouth consequent on the wearing of artificial teeth, but when the patients had worn them without removal for years it has been impossible in many instances to tell, after the mouth had been washed, that there had been a piece there at all. There was not a mark of it upon the mucous membrane, and that, even in the very earliest times, struck me as peculiar. But if a piece of gutta percha is put into the

mouth pressing exceedingly close, improperly so, and allowed to remain for any length of time—in some mouths very carelessly—then I have noticed the effect that Mr. Tomes has mentioned, but it is very very seldom, and it has always arisen in cases where I have negligently, or not with sufficient care, guarded myself against the points that I alluded to in my paper. Of course we all of us must know, with any artificial teeth worn a long time in the mouths of careless patients, how very red and inflamed the mucous membrane becomes, and how palpable it is, even to the most careless observers, that artificial teeth have been used; the edges of the hard palate become buried in such mouths. Now, that never happens with the gutta percha, properly used, because the edges are so elastic, and give way so freely under the pressure of the mouth in eating, that the natural structures are preserved quite healthy.

Mr. OWEN.—Although my experience in this use of gutta percha has been very limited, it has hitherto been wholly satisfactory. I am personally a debtor to Mr. Truman in connection with it. I had for many years been unable to wear a lower piece; several friends had made me pieces in gold, ivory and vulcanite, but I could not tolerate them, and gave up all expectation of having my deficiencies supplied. About nine months ago, however, Mr. Charles Rogers was good enough to offer to make me a piece on Mr. Truman's plan, and, except during the first week or two of its history, I have worn it with the utmost benefit and satisfaction, masticating with it perfectly. In my own practice I have used the gutta percha in conjunction with vulcanite, and have found it in certain cases to be invaluable, not only on account of its perfect adaptability and comparative softness to the gum, but for restoring lower pieces to their proper position in the mouth, when, through absorption, they have fallen and disarranged the bite. My method is simply to drill moderately large holes in *different directions* in the bottom of the vulcanite piece, cutting away also, and roughening it as well as I can; then to pack softened gutta percha into the holes with a hot instrument, taking care that they are thoroughly filled, and allowing the gutta percha to protrude slightly. By gently heating the bottom of the piece so prepared over a smokeless gas-flame, a cushion of softened gutta percha is made to adhere

to it closely and firmly by pressure upon a model; when cold, I trim the gutta percha with a hot knife, and then, having softened it by pouring hot water over it, I apply it to the mouth in the manner Mr. Truman has described. I have no doubt that this use of gutta percha has long since occurred to and been adopted by others; I nevertheless mention it.

Mr. Tomes's observations as to the state of the mouth in some cases in which gutta percha has been worn are important. I have two cases at the present time, a father and daughter, in which that condition is strongly marked; the gums are entirely denuded of their natural surface. The gutta percha in these cases was applied by the patients themselves, and appears to have been of the kind sold for taking impressions of the mouth with, and I incline to attribute the very disagreeable condition of the mucous membrane referred to by Mr. Tomes, not to the gutta percha, but to the large amount of mineral substances, metallic oxides, &c. &c., with which it is mixed. I have seen that compound of gutta percha to have been used in the mouth in other cases, and its blackened condition and roughness distinguish it unmistakeably from the pure kind, and make it very likely to produce the mischief alluded to. At all events, the subject is worthy of close observation.

Mr. TOMES.—Will you allow me to ask Mr. Truman whether the kind of gutta percha used in the construction of the cases we have seen this evening is at present to be had at the dental depôts? That which I have obtained is not so dense, and has a somewhat flaky appearance if allowed to get thoroughly dry, and may be torn up readily into shreds. Now, this that Mr. Truman has shown us this evening seems to remind one rather of a piece of coloured wax, so thoroughly dense is it.

Mr. TRUMAN.—I will endeavour to answer Mr. Tomes and Mr. Owen too. The quality of the gutta percha, of course, has everything to do with the health of the structures on which it rests. If the gutta percha is not pure, what it contains may be more or less detrimental. The gutta percha that has been procured from the dental depôts has been most various; sometimes loaded with white lead, and sometimes a mere sponge of white, rotten gutta percha put together, and sold simply because it was white. The gutta percha

which I have shown to-night as used by myself cannot at this moment be procured. It was only with great difficulty that I have been able to persuade the Gutta Percha Company to assist in what they think so small a matter. They are so extensive in their works that they consider it a matter quite beneath their consideration, and I look upon it more as a personal favour than anything else that I have been enabled to procure pure gutta percha, because the only secret is, as I have said from the beginning, *it must be quite pure*; there must be nothing in it except the colouring matter, and the colouring matter is nothing else than pure carmine itself—pure gutta percha with pure carmine—and it must be as dense as it can be. The only way to procure density is by pressure, and that pressure must be very great. Mr. Rogers knows the very great difficulty that I myself have had to get gutta percha pure, even for my own use. It has been constantly a source of sorrow to me that I could not supply gutta percha when I was asked for it by others who were using it.

Mr. OWEN.—May I ask Mr. Truman which of the gutta percha companies he referred to? There are two.

Mr. TRUMAN.—There is but one Gutta Percha Company. Of course I mean the one in the Wharf Road.

Mr. HARRISON.—I think, Mr. President, we must all of us feel very much indebted to Mr. Truman for the very able and very lucid manner in which he has brought this subject before us, as also for the very candid way in which he has detailed to us the results of his experience, and of the labour he has bestowed upon it for so many years. There can be no doubt, I think, too, sir, that it would be very desirable to apply this principle of plasticity to mechanical dentistry, which Mr. Truman so strongly advocates, if we could find a plastic material that is unobjectionable; as we should most of us be glad to avail ourselves of the facility with which such a material could be worked, and of the more perfect fit we could make with it. But, although this mode of working gutta percha would seem to be perfect (for nothing can be more beautiful than the specimens of work he has shown us), there is to my mind a great objection to the use of the *material itself* for the purpose for which he recommends it; for so far as my experience with gutta percha goes, I must say that I have never yet met

with any that would stand the action of the fluids of the mouth, or the chemical action of the various things that we take into our mouths as food and drink, for any length of time, without becoming offensive in the extreme. I have seen cases of gutta percha made by various practitioners, and cases made by Mr. Truman himself, but all, after being worn a certain length of time, have presented a rugged, soft, and spongy surface, which surface must necessarily attach to it the secretions of the mouth, and necessarily, therefore, become offensive. It may be that those specimens which I have seen of Mr. Truman's work have been some of his earlier productions; but certainly no specimen of gutta percha which I have seen worn in the mouth, put in by whomsoever it may, has been capable of preserving its purity for any length of time, and that seems to me to be a great objection to the use of gutta percha. I beg, then, to ask Mr. Truman (for I did not clearly understand him upon that point) whether he has, in his more recent experience, and in the communications which he has had with the Gutta Percha Company, yet come across gutta percha that will withstand for any length of time the action of the secretions in the mouth and the chemical action of the various substances which pass into our mouths to which I have referred, for that seems to me to be the real point upon which the desirability of the general use of gutta percha turns.

Mr. TRUMAN.—I would ask Mr. Harrison what length of time he thinks would be sufficient for the durability of gutta percha in its integrity to warrant its general use? You know pieces are worn in gutta percha, and are worn and worn for such a length of time carelessly that they become roughened and dirty and disagreeable, and ought long ago to have had the surface renewed with gutta percha. I do not look upon gutta percha as a permanent base for artificial teeth, just as we look upon gold, because one of the great advantages of gutta percha is that you can so readily renew it with great facility, and the patient must be careless who permits it to remain long enough to get into a bad state. I assure you this piece has been used in the mouth for two years. I took it out of the mouth last week, and but that I found great difficulty in getting hold of the pieces, the patients not being willing to part with them, I should have shown you some to-night that have been

used many years; but this piece is a good and fair sample, it has been in use exactly two years. I do not think that bone or anything else would be in a better state or a fairer state, because the gutta percha might have been renewed in six months had it been found advisable. If we can give our patients comfort by even a six months' renewal, we are doing them a great service; but such frequent regutta-perchaings are generally quite unnecessary.

MR. HARRISON.—It would be difficult for me to determine, sir, what amount of durability in any basis for artificial teeth ought to be satisfactory to us as a profession, but I would answer Mr. Truman's question by saying, speaking in general terms, that a basis cannot be too permanent; and I would illustrate the feeling of the profession on this point by referring to what I may term 'the fate' of bone-work, which we are most of us now giving up, I believe—I certainly am—for vulcanite, on account of its liability to decay after a comparatively short period of use. I believe I shall be considered correct in saying that we look upon work made of the hippopotamus tusk as being likely to last in the mouth, on an average, three or four years. I have met with cases in which such work has been destroyed in the mouth in the course of a twelvemonth, whilst, on the contrary, I have seen cases where the tusk of the hippopotamus, or walrus, has been worn in the mouth for eight or ten years, and has come out of the mouth in as good a state at the end of that time as when it went in, and indeed seemed to have become harder by wear; but these are exceptional cases. Now, sir, personally I should be unwilling to give up bone, even, for a material which is less durable, unless that material possessed some other very peculiar advantages—which, excepting its plasticity, I think it must be admitted gutta percha does not—and I would add, that when we have discovered a material applicable to our purpose more durable than bone, and which is at the same time unobjectionable in its general qualities—like vulcanite—I should incline to the use of that material, rather than to the use of gutta percha, with my present experience of it. With reference, however, to this case of gutta percha which Mr. Truman has handed to me, I beg to say (for I wish to discuss this subject with all possible candour) that if we could secure a gutta-percha basis which

would last for two years, and present at the end of that time, as a general rule, such an appearance as it does, a very great objection to the use of gutta percha, as recommended by him, would be done away with; although two years, I conceive, is a short period for a permanent set to last. But I have never before seen gutta percha, worn in the mouth for anything like two years, presenting as good a surface as this specimen does, and I conclude, therefore, that this is either a piece which has been worn by a patient who has been particularly careful, and who has had a particularly pure mouth (and may so be termed an exceptional case), or is a piece made of gutta percha of a peculiar quality; and I would beg to ask Mr. Truman whether his experience goes to prove that, as a general rule, gutta percha may be used for a couple of years, and present at the end of that time as smooth and as good an appearance as this does? I have not been in the habit of using gutta percha myself as a basis for teeth (except for temporary purposes), for the reasons stated; but my experience of its use in the mouth, as put in by others, leads me to make these remarks.

MR. CATTLIN.—I beg to ask Mr. Truman whether the gutta percha is heated to any particular degree of temperature before it is submitted to the screw pressure to which he has alluded, and whether he calculates upon expansion of the material after it has been finally placed in the mouth?

MR. TRUMAN.—I beg to answer the question proposed by Mr. Harrison. Gutta percha, like bone, varies very much in its durability in various mouths, but it varies more in its own qualities, as bone also varies in its own quality. I think it was Mr. Tomes who said that if you could keep bone polished you could ensure its durability. The fact is, that of course the more cleanly the patient keeps his mouth, the more the piece is scrubbed and brushed hard with powder—pumice stone, I said in my paper, and I mean thoroughly well brushed with pumice powder—the longer it wears. In the average of early cases, when we did not use gutta percha, we thought we should see our patients again once in two or three years, as Mr. Harrison suggests; but my experience of gutta percha is that the interval between the visits of the patients to me is very much lengthened. I take that as a broad and extensive way of answering the ques-

tion. The visits of patients to me since I have used gutta percha are further apart, and, therefore, gutta percha must be more durable, or, at any rate, must remain comfortable longer than the old pieces did. The roughening and dirtiness of the surfaces depend, as I have said in my paper, upon the density of the gutta percha, and the density of the gutta percha of course depends in a great measure upon its quality. First, it must be very good, and next it must be properly prepared. That preparation is a very laborious and a very long task. The Gutta Percha Company have seen me do it over and over, and have said it is too tedious. But they will do it now, and you will have a very much better quality than ever I have been able to get, because they will do it well. Whatever they do do, they do well.

With regard to Mr. Catlin's question with reference to the heat, I have said you must not boil it. But you must go as close to that point as you possibly can. The water may be just below boiling heat, it may even boil if you will only watch it, and mind that the boiling does not open the pores of the gutta percha. Then it becomes of a temperature which very nearly approaches boiling water. In that temperature I place it in my plaster moulds, not as I pack vulcanite, because in packing vulcanite I put it in little pieces. But in doing gutta percha (I meant to have shown it you all to night absolutely, but I had no time to prepare the things, or else I told your secretary that I should do every thing before you. At some future day, if the members wish it, I will do all the process before the Society) (applause) the gutta percha is used in a mass, a roll, a lump, perhaps twice or three times as much as would be required for the piece. It is placed between the two halves of the matrix, the metal part, together with the teeth fastened on, being put into that half of the matrix that it fits, and then put one on top of the other, and subjected to pressure under the press. The press must go down exceedingly slowly, otherwise the piece may get shifted by the uneven pressure, and injure some of the mineral teeth. In all the pieces I have done I have only found one mineral tooth break under the pressure, and that, perhaps, was because it was hurriedly done. Then allow it to get quite cold under the press, and when you take it out—Mr. Tomes has said that the gutta percha I have shown is solid, if he will

look at this (handing a piece of gutta percha) he will find that it is solid—in that way the gutta percha will come out of the press very solid.

There is another question I might at the same time answer. Mr. Owen said that he drilled holes into the bottom of the vulcanite. I would show him a little piece of continuous gum made without a metal base, which has fastened to it a film of platinum wire gauze. I would suggest that if you use a vulcanite superstructure you should line it with platina wire gauze, and then by pressure the gutta percha will go into the mesh of platina wire gauze and the two will become perfectly fixed, as though they were sewn together by thread.

Mr. HERBURN.—Although the hour has nearly arrived for closing our meeting, I cannot help joining in the expressions already uttered, that we are much indebted to Mr. Truman for the able and elaborate manner in which he has brought the practical principle of plastic mechanical dentistry under our notice. I think that the reading of such a paper before the Odontological Society tends only to give the subject that prominence which is so justly its due. Mr. Truman has entered as fully as our time would allow him into the various contrivances for making dental structures on his principle, and probably many of us now present have received additional information to that which we have had previously upon the subject. I may state that I commenced the use of gutta percha nearly seven years ago. At that period several friends joined in a course of experiments on this substance, for its application to dentistry; we have since, of course, carried its use to greater perfection. At that time I placed an under piece in the mouth of a patient—this patient I saw only last week, and to my surprise I found the gutta percha as perfect as when first made. I mention this case, as Mr. Harrison has just asked a question in reference to its durability. There is one point I do not think Mr. Truman has touched upon, neither do I remember its being alluded to during this discussion, and that is the value of gutta percha in temporary pieces. In such cases, I find its use of great utility; cases frequently occur in practice, when it is of the greatest importance to replace teeth immediately after extraction; formerly this was nearly impossible, but with gutta percha as a basis, it is now comparatively easy; after taking the model, finishing the bone piece, drilling the foundation in the manner described by Mr. Owen in

reference to vulcanite, applying the percha and fitting it to the gums, you will find it most efficacious—with such a basis whole sets may be applied with great facility. Of course the percha requires changing every week, or every month, as may be requisite, and this until such time as the absorption of the alveolus and gums has ceased, and the mouth in a healthy state to receive the permanent set. I merely name this, because I have found it most useful. At the same time I have no doubt but that many of you have used it in a variety of cases with equal advantage.

Mr. HARRISON.—With respect to what has fallen from Mr. Hepburn, I may say that I quite agree with him as to the value of gutta percha used as a basis for temporary pieces. I have within the last week, only, put in a gold piece for a lady for whom I made a gutta-percha piece last autumn; but this was confessedly a temporary piece. My objection to gutta percha has been to its use as a *permanent* basis, on account, as far as my experience has gone, of its being so exceedingly liable to become soft, ragged, and offensive, in a short space of time. I have certainly never seen, as I have already said, a gutta percha piece that has been worn anything like two years presenting as good an appearance as that which Mr. Truman has shown us, and as he tells us that it is not an exceptional case (and has had very much more experience in the use of this material than I have), I am quite free to admit that I shall leave this room having a better opinion of gutta percha than I had when I entered it; but I must say, nevertheless, not yet satisfied that it is the best material we have as a permanent basis for artificial teeth. Before I sit down, sir, I beg, notwithstanding the opinions I have ventured to express on this subject, to repeat to Mr. Truman my sense of the obligation we owe him, and to offer to him my personal thanks, as an individual member of this Society, both for the very able way in which he has gone into this subject, and for the very candid manner in which he has given us the benefit of his labours and of his extended experience in connection with it. (Applause.)

Mr. TRUMAN.—Mr. Hepburn says that I did not mention the temporary use of gutta percha. The temporary use of gutta percha in my hands amounts almost to its permanent use, because in such a case as Mr. Hepburn was now speaking of, if teeth had to be extracted, and the patients could not go into society without their front teeth,

I should make a framework of metal so constructed that it should simply give strength to the piece, and the piece fitting so, entirely dependent upon the gutta percha to the mouth. Probably if the teeth had just been extracted I should be very careful to alter the surface after I had fitted it to the mouth, so as to leave a surface which would enable the mouth to heal with comfort. Then I should say to the patient, "Wear that as long as it remains comfortable to you; but immediately that you experience any discomfort, come and have it altered." Then I should remove the gutta percha from my gold framework, and put on fresh, fitting it as before to the mouth, and not to the model. That would continue until the mouth was quite well, and the piece that was made originally under the first circumstances would be still useable, still permanent, still good. It would not be a temporary piece, but it would be a temporary piece rendered permanent by the removal of the gutta percha. In answer to Mr. Harrison, I may show him another specimen of gutta percha. I said in my paper that when we met with cases in which there is a tendency—we cannot put clean things into dirty places without the clean things becoming dirty, and in our practice we must meet with mouths where there is a decided tendency to offensive odours—the piece becomes disagreeable. In such cases, if the gutta percha we used was not of the most dense, close kind, in twenty-four hours the mouth of the patient would be most offensive; you could not approach them at all, because the pores of the gutta percha would be filled with offensive effluvia that was pregnant in the mouth. In such a case as that, if it was a matter of comfort to my patient, I should use gutta percha, such as I now have in my hand—not pink, pretty-looking gutta percha, but dense, ugly-looking gutta percha, without a pore in it. That will wear—I do not like to say how long. Then I wish to state to the Society another curious fact about gutta percha. Mr. Harrison said that he has found in some cases bone sets which have been actually better after they have been worn some time than they were at first—

Mr. HARRISON.—In a few exceptional cases.

Mr. TRUMAN.—I mean in some cases. You probably, most of you, remember old Mr. B—. Mr. B— was a dentist, and had often tried artificial teeth, but never had been able to succeed in using them.

In 1848 I put him in a little piece of gutta percha, and about twenty-four hours after the piece had been in his mouth, Mr. B— came to me. I can assure you it was by no means pleasant; it was one of the most offensive pieces I ever met with in my life. I immediately said, "You can never use this thing, it is quite beyond hope; take it out of your mouth, throw it away, it is perfectly useless." But the old gentleman said, "No, I mean to retain it. I never see any body, and I mean to keep it, because with it I am at last quite comfortable." I did not see him again for six weeks or two months. When he came back, I took it out of his mouth and washed it thoroughly. To my astonishment, it was perfectly sweet—sweet as compared with the mouth, which was by no means a pleasant one. And why was this? why the pores had become filled with the earthy matter from the saliva, and the gutta percha happening to be a very good piece, the mineral matter had completely shut up the pores, and gave the gutta percha a mineralized surface, which lasted until that man died—I do not know how many years afterwards. That is an instance which has been verified by constant repetition of the same cases ever since. That is why I advise the pumice stone or powder to be used constantly to clean the pieces with, because if there is any tendency to porosity, the mineral matter fills up the pores, and you get a perfect surface, such as I have shown you.

The PRESIDENT.—We have long exceeded our time, but I am sure all present will admit that it been profitably employed. A more lucid and satisfactory exposition of the matter brought before us could not have been given. The pieces which have been handed round to us are in themselves perfect and beautiful specimens of work. I have had no experience myself in gutta percha, and therefore it would be absurd in me to hazard any opinion concerning it. Mr. Truman has kindly offered to furnish us, on some future occasion, with further exemplifications of his practice, and I hope we may rely upon him for such assistance. In the name of this Society, I now beg to thank Mr. Truman for his very able and practical paper.

I think the members of the Odontological Society will agree with me, when I say, that the papers we have had this season have been remarkably interesting, and will form valuable records of our transactions. I have many reasons for believing that

our ensuing meetings, which commence in November, will be in no way inferior to those which have preceded them. When I tell you that we have promises of papers from Mr. Tomes, Mr. Cartwright, Mr. Bridgman, and several other well-known members of the Society, I think we may have confidence that our next session will even surpass the present, which has been one of unexampled prosperity. I have now to adjourn the Society until the first Monday in November. (Loud applause.)

THE LATE HENRY A. DEWAR.

WHEN we find a man actively, conscientiously, and energetically engaged in the profession he has adopted,—pursuing for a considerable time, both at home and abroad, the favorite theme, we very presently conclude that such an one will gratify us with his progress, and instruct, if not astonish us with his success. That there are many men who are, or have been, thus occupied in all the divisions of society, we admit, and we believe that our own profession would furnish a respectable proportion, if the investigation were necessary or desirable. But now and then the fact is summarily announced, and the name revealed under painful, very painful circumstances. What the genuine worth and modesty of such men would keep secret, or, at least, hide from the public view, the keen scythe of death remorselessly lays bare. In recording, under precisely these circumstances, the sudden death of Henry A. Dewar, late of Aberdeen, we announce a substantial loss to our profession.

Mr. Dewar was one of those unostentatious but zealous men, who, keeping one of the great ends of life in view, left no stone unturned by which he could help the stately march of progress, and disencumber the path of science and utility of its weeds and impediments. Of considerable skill in mechanism, he was constantly planning some new contrivance to perfect the various apparatus at our disposal; and one of his last efforts was given to the profession in the form of an ingenious machine for the better packing of vulcanite. About twelve months ago he read a paper on this subject before the Odontological Society, which was well received. Mr. Dewar was born on the 14th August, 1812, at Lassodie, the family property, and the oldest estate in Fife, with one exception; and with that house the family became connected in 1575, by the marriage of Mr. David

Dewar, of Lassodie, with one of its members. His father, the late Dr. Dewar, was a man of note, both as a practitioner and contributor to the literary and scientific knowledge of his times, and his son followed most worthily in his steps. The subject of this notice very early commenced the study of medicine in Paris, from whence, after a four years' residence there, he accompanied his family to America, and entered at Dartmouth College, New Hampshire, where he passed his examination, and took his degree of Doctor of Medicine, December, 1834, after which he settled for some years at Boston. For the last sixteen years Mr. Dewar practised in Aberdeen, where he was greatly esteemed by a large number of friends. Among other distinctions, he held tickets of "Le jardin du Roi," for zoology and geology, and of the medical schools of Paris, a diploma of Bachelor in Letters of the University of France, a diploma of member of the Massachusetts Medical Society. He was likewise a member of the Odontological Society, and in April, 1860, took his degree as Licentiate in Dental Surgery, of the Royal College of Surgeons of England. Just as his father was removed in the full exercise of his talents, so our late friend was arrested in the middle of his useful and honorable career. Dr. Williamson, one of his medical advisers, states that at twelve o'clock on the morning of his death he was in his usual health, but shortly after noon he expired. A post-mortem examination proved that the cause of death was disease of the heart. By this unhappy event, which occurred on the 15th April, the Mechanic's Institute of Aberdeen has lost its president, the Odontological Society a warm and zealous member, and the newly-formed body of Licentiates in Dental Surgery one, and the *first one*, of their number. It is not within our pro-

vince to dwell upon the private worth and social characteristics by which Mr. Dewar was distinguished, but we can safely affirm that they who knew him best in these relationships loved him most. He was one of that small number who prefer spending all their resources in the advancement of their profession, rather than make it a stepping-stone to wealth. Such men do not grow rich, but they erect for themselves a memorial in the hearts of their friends, which money cannot purchase, nor time destroy.

"Multis ille bonis flebilis occidit."

Peace to his ashes !

ROYAL COLLEGE OF SURGEONS.

THE following gentlemen having undergone the necessary examinations, received their diplomas in dental surgery at a meeting of the Board on the 11th instant,—viz.: Messrs. William Hunt, Pen Villa, Yeovil; W. C. Bridgman, St. Giles'-street, Norwich; Walter Campbell, Tay-square, Dundee; Octavius Annesley Fox, Pavilion-parade, Brighton; G. W. Smith, Ayton-street, Manchester; A. D. Hart, Brook-street, Hanover-square; H. H. Hayward, Queen Ann-street, Cavendish-square; J. T. Cunningham, Edinburgh; J. G. Robinson, Crescent, Carlisle; W. S. Clement, Bath-place, Kensington; H. H. Goddard, Connaught-square, Hyde-park.

THE DENTAL HOSPITAL OF LONDON.

WE have much pleasure in announcing (which we can do on authority) that his Royal Highness the DUKE OF CAMBRIDGE has accepted the office of President of this Institution.

The Month: Miscellanea and Scientific Intelligence.

A COLLEGE OF DENTISTS.

(From 'The Lancet,' June 8th, 1861.)

THE knot of gentlemen who lately clubbed together to call themselves the College of Dentists have since proceeded to put themselves in funds by an extensive distribution of diplomas, whence have sprung consequences tending to disgrace

the name of College, and to degrade the profession of dentists. In view of their loud protestations of anxiety for the honour of their profession, and accepting their pretension to perfect independence of action as a possibly conscientious motive for refusing to profit by the Charter granted in their behalf to the College of Surgeons by the Government,

we expressed lately the opinion that the medical profession would be willing to overlook their past errors and manifold mis-statements, and to judge of their earnestness and good bearing by their acts. It is now apparent that they have justified some of the bitterest predictions of their opponents, and stamped themselves with disfavour. The highest but most salutary restraints appear to have been cast off, and the showering of diplomas seems to be carried on with little regard to the interests or honour of the profession. In order that a full judgment might be formed of the laxity which has thus been shown, it would be necessary to collect and quote the numerous puffs which now fill the London and country papers. These advertisements emanate from dentists, whose habitual trick of inserting trade advertisements, puffing their particular wares, and vaunting their peculiar skill, has not prevented their election, nor has their election into the "Collego" arrested or modified their course of proceeding. Not only do these persons continue their plan of advertising after election, but they proceed to enhance the attractions of the manifesto by announcing themselves as M.C.D.E., or in full length, Member of the College of Dentists of England. There is only one collegiate institution in London with which we are acquainted that is equally self-constituted, and equally widely advertised for trade purposes; it is the "Morisonion Institute," or "College of Health." It is desirable that no mistake should exist as to the powers and authority of this College of Dentists; for from the moment that it lends its name to advertisers who offer to supply teeth at £2 per set, "and unless the utmost satisfaction is given no fee is required," to others who advertise their "sole patents and inventions," to others who announce that "persons may be attended at their own residences without a fee,"—from the moment that it prostitutes the title of College, which it has assumed, to become the decoration and the bait of such placards, it is false to the purpose which it announced in claiming our suffrages, and it ceases in any sense to represent the honour or the interests of the more respectable part of the dental profession. We can heartily sympathise in the protests which these gentlemen have put forth in their recognised organ, the British Journal of Dental Science. It is important for the interests of the

Licentiatees in Dental Surgery now affiliated to our body, it is important to all who value their social and intellectual status, that they should not be supposed to be represented professionally by a body which can consent to practices so undignified, or allow its name to be paraded as a sanction to proceedings so entirely opposed to the canons of professional conduct.

BOOKS RECEIVED.

'Der Zahnartz,' May and June, 1861.

To Correspondents.

NOTICE.

Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.

We have received several letters from correspondents, complaining of the late delivery of their copies of the Journal. We can only state that the delay has not been occasioned by our Publisher or ourselves. During the past three months, subscribers who receive their copies by post direct from the office, were supplied on March 20th, April 19th, and May 18th, as the Journal was published, and could be obtained on the days named. Our correspondents must address their complaints to the agents who supply them.

'Ad. zur Nedden, Nürnberg.'—Es wird uns grosses vergnügen machen unsere Zeitschrift mit der Ihrigen zu tauschen. Wir haben deswegen unserem Herausgeber schon gebeten dass er Ihnen immer die Zeitschrift sogleich schicken soll; wenn aber irgend eine unregelmässigkeit vorkommen sollte in dem Empfang des Journals, seien sie so gefällig einen Brief an dem Redacteur zu schreiben zum adresse, 11, New Burlington Street, London.

We much regret to have to postpone, from press of matter, a most interesting paper from Mr. Spence Bate, also papers by Messrs. Boyntun and Buist, all which will appear in our next.

Communications have been received from Messrs. A. F. Boyntun, Swansea; Bridgeman, Cox Smith, Alfred Coleman, C. Vasey, G. Owen, Cattlin, and Buist.

[ADVERTISEMENT.]

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A Price List forwarded on application. Country Orders punctually attended to. Gentlemen waited upon by appointment before 10 o'clock in the morning.

British Journal of Dental Science.

No. 61.

LONDON, JULY, 1861.

VOL. IV.

Dental Surgery and Medicine.

ON THE TREATMENT OF ALVEOLAR ABSCESS.

BY C. SPENCE BATE, ESQ., L.D.S., R.C.S.

THE publication of a paper on this subject, with the addition of the title "And cure," by Mr. Shadoan, in the 'Dental Register of the West,' which was last month transferred to the pages of the *British Journal of Dental Science*, has induced me, earlier than I had intended, to communicate the result of my endeavours to obtain a successful issue from the treatment of alveolar abscess.

I do this with the more regret, because in private practice it takes a long time to be able to obtain extended observations. It is not every patient that one can induce to submit, or is willing to urge to submit, to an operation that in one's own mind bears the stamp of an experiment.

It is first necessary to single out cases that offer as small amount of obstruction in the way of a successful issue as possible, and, secondly, to select those patients who are themselves willing to assist and co-operate in the treatment. I suppose that there are few practitioners who have not had occasion to regret that cases of the most promising success have failed through the want of the co-operation on the part of the patient, which was promised and expected. It is for reasons such as these that I think it would have been better to have delayed until a sufficient number of unequivocally successful cases could have been laid before the profession, for the three successful and one unsuccessful case of Mr. Shadoan, afford too limited a data to arrive at any conclusion. But the subject being broached in the pages of the

Dental press, many persons will probably direct their endeavours to the treatment of alveolar abscess. I wish, therefore, to record those cases that I have had the opportunity of treating. In doing this, it will be my desire to communicate the unsuccessful as well as the successful cases. In fulfilling the latter portion of my engagement, I must take to myself credit for a large amount of moral courage. For I consider that it requires much courage to confess a failure in the pages of a medical journal, whether special or general. For the experienced reader of years must be struck with the remarkably satisfactory fact that the treatment of most recorded and published cases, through the ability and skill of the operator or attendant, resolve in a successful issue.

The experience of some years has convinced me that however valuable the record of the treatment of successful cases may be, the records of the unsuccessful cases is quite as valuable, and as frequently direct to the correct nature of the disease, and character of the treatment.

1. The first case that I had the opportunity of treating since I had conceived the present mode, was August, 1858. Miss H—s called, relatively to a swelling in the roof of the mouth, it was red in colour and flexible to the touch, it was evidently the result of a deep-seated abscess. Her teeth were generally sound; the left upper canine was attacked at the frontal aspect of the neck by molities, the probable result of the dentine being exposed by the friction of the tooth-brush driving back the gum.

Attributing the palatal abscess to an inflammatory action set up in the pulp of this tooth, I determined to cut into and

extirpate the pulp, hoping that the cavity so made would form a channel for the exit of the pus. I accordingly removed all the softened tissue, and ultimately the hard dentine overlying the pulp cavity. Upon reaching the pulp, it was found to be in a healthy condition, without any great amount of the distension of the capillaries, and highly sensitive. I enlarged the orifice of the cavity as much as possible, and, with an instrument I made for the occasion, extracted the pulp from the tooth. I preferred this mode to killing it with an escarotic, inasmuch as the treatment was confined to the organ itself, and being fortunately conveniently situated, I was enabled to operate without much chance of failure. Having removed the pulp, I immediately plugged the tooth with a pledget of cotton, and sent my patient away for a week.

After that period, I found that there was no beneficial result as far as the palatal abscess was concerned, which appeared to have increased, and from the tenuity of the integument exhibited symptoms of a speedy perforation through the palate. I therefore determined to puncture the abscess at the extremity of the fang of the canine tooth, which I did by means of a broach fixed in an Archimedean drill. Having first saturated the part two or three times with chloroform, the operation, much feared, was pronounced comparatively insignificant; I then plugged the tooth temporarily with gutta-percha stopping. The lady lives in Somersetshire; I met her early next morning on her way to the train, when she, in good spirits, informed me that the swelling in the roof of her mouth had almost disappeared.

I am perfectly aware that a coincidence may be taken for a result. But even if the reduction of the swelling may be due to resolution, I think that we have a right to infer that the cause was superinduced by the treatment.

Six months after I heard from her, to the effect that recently the gutta-percha temporary stopping having fallen out, she found the swelling slightly produced. I sent her a fragment of gutta percha to keep in the tooth, and desired that she should let me see her if the swelling increased. I begged her also to attend to the state of her health generally.

Some eight months later she again visited Plymouth, when I found the place of the swelling indicated by a small puffy spot. I then permanently stopped the

cavity in the canine with gold, and up to the present date she continues well.

I ought, at an earlier stage, to have stated that her general health was weak, that there was some fear of there being a phthisical condition of the lungs, she is now much better. This fact no doubt had no inconsiderable influence on the successful termination of the local disease.

2. Miss H—r, May 15th, 1859. Had toothache in one or both the upper premolars upon the right side. There being large cavities in both, I filled them with cement (Ash's). About a fortnight after she called; having at first experienced relief, she had recently found the pain to return, annoying her only at night. I suggested medical treatment of the stomach in the form of aperients and cooling medicines, but which afforded no permanent relief. A swelling soon after commenced to show itself between the fangs of the two premolar teeth. Sounding the teeth by an instrument, I found the anterior to be much more sensitive than the posterior, I therefore considered the abscess to be in connexion with the first rather than the second premolar. I therefore determined to perforate through the alveolar plates to the abscess at the extremity of the fang of the first premolar.

Some days elapsed, during which I suggested sedative topical treatment and cooling systemic treatment, but it appeared of little avail; the tenderness continued in both teeth, nay, increased so that I extracted both premolars, on the 16th of June, just one month from my first treatment of the teeth. The extraction was performed at the urgent desire of the patient, who found her nights' rest seriously broken in upon. Examination of the teeth after extraction, showed that the one that had been punctured had the peridental membrane entirely free from congestion of the capillaries, whereas that which had not been drilled had the vessels turgid and full of blood.

I am inclined to think that the want of success in this case depended much upon one only of the teeth having been punctured, whereas both should have been so treated; the inflammation continuing active upon the tooth that was not punctured.

(To be continued.)

THE BUCCAL SECRETIONS.

By J. TAFT.

[Read before the American Dental Association, Washington, D. C., Aug., 1860.]

(From 'The Dental Cosmos,' Sept., 1860.)

THESE natural products of the animal economy have received some attention and consideration by physiologists and pathologists all along through medical investigation, from the beginning to the present time.

In regard to the value and importance of these secretions, there has been some diversity of opinion, or rather in regard to their functions, though they have usually been regarded as playing a very important part in the incipient stages of digestion.

The insalivation of the food, at the time of mastication, *preparatory* to deglutition and digestion, have been considered the chief functions of the saliva. While these may be considered the prominent offices of this secretion, there are others accomplished by it of no insignificant character; such, for instance, as aiding in the enunciation of language. Without the moistening, lubricating influence of the saliva, how imperfectly, if at all, would language be uttered!

Again, this product could not be retained in the blood with impunity. It is necessary, for the health of the blood, that every secretion that nature designed should be withdrawn, be duly removed by its appropriate apparatus.

Within the scope of this paper we intend chiefly to consider the buccal secretions, with reference to the influence upon the teeth, both in a state of health and disease.

It seems scarcely necessary here to enter into a minute consideration of these secretions in a state of health, since this has been so often and so elaborately done already. A few remarks here, in regard to the nature, composition, and elaboration of the saliva, will, however, not be out of place.

The product usually found in the mouth is denominated mixed saliva. It consists of the secretions elaborated by the buccal mucous membrane, as well as by the various salivary glands.

The saliva, as ordinarily found in the human mouth, is an opalescent or faintly bluish-white fluid; it is viscid, tenacious, inodorous, and tasteless. After being at rest for a time, it deposits a grayish-white sediment; this consists principally of epithelium scales; these are not seen in the fresh

saliva, but soon deposit themselves when the fluid is at rest, and exposed to the air; mucous corpuscles also exist to some extent in the saliva.

Unmixed Saliva.—The products of the different salivary glands exhibit some variety in composition. The saliva of the same person under different physiological conditions will be different in some respects, and in none more than in specific gravity. Various circumstances will modify it in this particular; such, for instance, as the amount and character of the food.

Wright has demonstrated that human saliva is more dense after food has been taken than when fasting.

The saliva of a healthy man who had lived for a week on a mixed diet varied in density from 1.0079 to 1.0085, while after a purely animal diet for an equal time, it varied from 1.0098 to 1.0176; and after a purely vegetable diet, from 1.0039 to 1.0047.

He also remarks that moral emotions (rather mental emotions), atmospheric changes, light, sound, &c., exert an influence on the density of the saliva. In two hundred cases he found the specific gravity of the saliva to range between 1.0069 and 1.0089.

Pure saliva should be obtained from the ducts of the salivary glands, in order that it may have no admixture of mucus, nor any foreign substance; it should also be obtained without the aid of irritants or stimulants. "A very simple and ready method of collecting a large quantity of saliva in a short time is by exciting a strong pressure under the chin, and at the same time titillating the palate with a feather: a feeling of strangulation immediately ensues, during which the saliva is rapidly ejected from the mouth."

The glands that elaborate the saliva are the following, viz., the parotid, the submaxillary, and the sublingual. The general features of the products of these different glands are very similar; though some have affirmed that a marked difference is found in many cases. My own experiments have shown but slight difference in the saliva from the different glands.

Pure saliva is perfectly limpid and colourless, without odour or taste, and incapable of being drawn out into threads, and of a distinctly alkaline reaction.

Prolonged hunger, or the use of indigestible or stimulating food, causes the secretion of concentrated saliva. During fasting it approximates, and in prolonged abstinence attains, an acid reaction. It is

definitely alkaline during and immediately after meals. Its character is quite variable under different pathological conditions; but of this hereafter.

The saliva always possesses the following ingredients:

First. Potash, soda, and lime, combined with organic matter.

Second. An extractive matter soluble in alcohol, precipitable by tannic acid.

Third. Sulpho-cyanide of potassium.

Fourth. Potash salt.

Fifth. Epithelium and mucous corpuscles; these are very slight in pure saliva.

Sixth. Chlorides of sodium and potassium.

Seventh. Traces of phosphates.

There have been many experiments and analyses made upon the saliva, almost every one of which differs in some slight degree from all the others. These differences, however, are not greater than should be expected, owing to the different specimens operated upon, and the difference in the modes of conducting the experiments. Notwithstanding the discrepancies that have been exhibited by these different experiments, yet the leading features and characteristics have been manifestly the same, and fully established.

It is difficult to estimate the amount of saliva secreted in a given time; there are so many circumstances that modify the quantity, that it is difficult to arrive at anything very definite in this respect.

It is regulated in quantity by the condition of the patient, either constitutional or local, or both. When there is no abnormal condition, it will be subject to fluctuations, dependent upon the character of the food employed, and the manner of using that food. Dry food calls forth more saliva than moist, and hard far more than soft; substances of a pungent or irritating nature more than mild pleasant substances. The act of mastication is the most common exciting cause of the secretion of saliva.

The movement of the mouth in speaking and singing excites a flow, unless the speaker is in a high state of mental excitement; then the secretion may be arrested altogether, as is often experienced by timid speakers.

The flow of saliva continues for a brief period after the use of food. Food mixed with water requires very little saliva.

Colin, in his observations on the secretion of saliva in the solidungulous animals,

remarks that the secretions of the two parotids alternate; the parotid of the side on which mastication is going on secretes at least one third more than that of the other side; and when mastication is changed to the other side, the corresponding parotid goes vigorously to work; the action of the first partially ceases.

The same rule operates in the secretion of the human saliva, though probably not to quite the same extent.

The parotid glands yield about two thirds of the whole amount of the saliva elaborated; the submaxillary about one twentieth, and the sublingual the remainder. The amount of saliva is governed by circumstances. During sleep there is little or no saliva secreted. The sight and odour of food will usually excite a flow of saliva, particularly if there is hunger. Nausea will generally excite a free flow of the buccal fluids; at such a time the mucous glands become especially active.

The various mental conditions operate variously upon the salivary glands; fear diminishes the secretion very much; fright checks it entirely; anger also diminishes it; while good humour and mirth increase the secretion. Erotic emotions increase the solution of the mucus considerably, and that of the saliva to some extent. Grief augments the secretion of both the saliva and mucus.

Fluctuation in the quantity of water in the blood has but little influence upon the amount of saliva elaborated in a given period. Neither does it change the relative proportion of the solid constituents of the saliva.

THE OBJECTS OF THE SALIVA.—Lehmann remarks, that the office of the saliva may be regarded as threefold, viz., mechanical, chemical, and dynamical.

Many kinds of food have but little moisture, and require to be moistened with the saliva in order that more perfect mastication may be accomplished, and especially that the act of deglutition may be accomplished with facility; it lubricates the bolus, and makes it manageable in the mouth. Perfectly dry food in the mouth is unmanageable. Without the moistening and lubrication of the food in the mouth, the mucous membrane would be irritated, and ultimately highly diseased by friction; this would result to the mucous membrane of the throat and œsophagus, as well as to that of the mouth.

The food is prepared by insalivation for

being most perfectly acted upon by the digestive fluids. *The chemical action of the saliva upon the food is a question upon which there is much diversity of opinion; some maintaining that it serves only to moisten the food, and at that point its influence ceases; others contend that it exercises a concurrent influence with the gastric fluids throughout the process of digestion. There are some points, however, that are well established. By insalivation the food is much better prepared for being acted upon by the gastric fluid than if it was not moistened at all, or than if moistened simply with water. Again, starch is converted into sugar by the action of the mixed saliva. This is probably accomplished by the mucus. Experiments have been introduced that lead us to conclude that the unmixed saliva will not produce that result.*

Lehmann remarks, "it can, therefore, no longer be doubted that the saliva in a normal condition, when it is mixed with the food, possesses the property of converting starch into sugar."

Wright considers that one of the more prominent functions of the saliva is that of stimulating the stomach, and thus promoting the digestive process. This rests, however, quite as much upon hypothesis as demonstration.

Pathological conditions.—The diseased and unnatural conditions of the buccal secretions have not received that attention and investigation which we think the subject demands; this arises from the supposition that the subject is one of little importance, and from the difficulties attending such investigation.

The saliva is subject to many and great changes, by disease. The saliva proper may be changed from its natural to a definitely acid reaction; or it may be changed to more than its alkaline condition. This latter is exhibited when salivary calculus is rapidly deposited upon the teeth.

Any change of the mucus is usually to an increased acidity. When this condition is produced to such an extent that it is not neutralized by the saliva, as is generally the case when green tartar is deposited upon the teeth, it then becomes a source of mischief.

Probably in no cases except those of an extreme character is there any direct injury upon the teeth by these changes of the saliva; but that the decomposition of foreign substances in the mouth is greatly

facilitated by these changes, there can be no doubt.

The extent of the injury resulting from vitiated secretions will be exceedingly various, depending upon a great variety of modifying circumstances.

The saliva becomes changed to an abnormal or diseased condition in two ways. First, by a vitiated state of the blood, and second, by a diseased condition of the glands; the latter is often complicated with the former. The saliva is more frequently affected by a deteriorated state of the blood; but the mucus by an unhealthy condition of the mucous follicles. These, being situated in the mucous membrane near the surface, are more exposed than the salivary glands to the influence of local irritating causes.

The salivary glands are often required to perform more than the natural amount of labour, sometimes from local stimulants, as in the use of tobacco or any similar agent; and from the constant use of the jaws in mastication, and from general constitutional causes, as in pyalism, and various vitiated conditions of the blood.

When any organ is overtaken, its production is necessarily deteriorated. A general inflammatory condition of the system produces an acid state of the saliva. Rheumatic affections, if general, produce the same result.

In febrile diseases the secretion of the saliva is very much diminished and sometimes checked altogether; then, the secretion of mucus being kept up, the teeth suffer injury, for the mucus, at such times, is always in a vitiated condition when secreted, and changes rapidly to a worse condition while in the mouth. The water evaporates and leaves a thick tenacious sordes covering the teeth, and lining the mucous membrane of the mouth. During this state of things, the teeth, without great care, are injured extensively and rapidly. The utmost care should be exercised to keep the teeth clean during a time of sickness, and especially when this peculiar condition exists. Much of the injury attributed to medical agents is dependent upon just the state of things to which reference has been made.

This vitiated, thickened, decomposing mucus will act directly and with great rapidity upon the teeth. It also facilitates the decomposition of the foreign substances with which it may come in contact or commingle, and thus indirectly operate an injury upon the teeth.

A peculiarly vitiated state of the saliva is often found in connection with a lymphatic temperament, especially where there is a strumous diathesis. The saliva is viscid, somewhat thickened, is easily drawn out into shreds or strings; it does not readily mix with the atmosphere, does not become frothy. Usually when there is this state of the saliva, the teeth decay very rapidly, and are very sensitive, especially if the constitution of the teeth is good or medium; but if they are poorly organized, the vitality may be destroyed in advance of the decay. Saliva in this condition operates rapidly upon the teeth, both directly and indirectly. All the care that can be bestowed upon the teeth in respect to cleanliness will not arrest caries nor change its character while the buccal secretions remain in the condition just described. The mucous membrane of the mouth is always in a more or less irritable condition in these cases, and this will be kept up during this state of the saliva, and probably by its influence chiefly.

In order to remedy the evil results from this condition of the saliva, it must be restored to health; this can only be done by constitutional treatment, for it doubtless depends upon a depraved state of the blood. The secreting organs are, doubtless, always more or less affected; but when the original cause of difficulty is removed, the secreting

apparatus will assume a normal condition and a healthy action.

There is another depraved condition of the saliva not so marked in character nor injurious in its effects as that just referred to. It is characterised by a semi-oily condition; it is free from that tenacity and stringiness exhibited by some other depraved conditions. It insinuates itself into every interstice where it can at all approach; it will moisten the surfaces of the teeth when the utmost care is taken to protect them; the dentist will thus often find himself exceedingly annoyed by saliva of this character. Where it exists, it is almost impossible to keep an operation dry. This peculiarity is derived from the mucus, which in such instances is elaborated very freely.

The pathological changes and conditions to which the buccal secretions are subject is a matter upon which but little has been written, and less investigation made, especially with reference to their influence upon the teeth. It is a field in which investigation is somewhat difficult, yet there are no insurmountable difficulties in the way; it may be as thoroughly explored as some that have received much attention. It is an exceedingly important subject to the dentist and his patient; one that we all have neglected too long. Now in the future let us give this subject the attention its importance demands.

Mechanical Dentistry.

ON HARDENING AND TEMPERING STEEL.

THE following paper is extracted from the first volume of Mr. Holtzapffel's elaborate and interesting work on 'Turning and Mechanical Manipulation.' The vast variety and practical character of the information contained in that work make it invaluable to any who are engaged in mechanical operations, and we have ourselves derived so much information from the perusal of it that we cannot refrain from recommending the work to our professional brethren. We do not feel that any apology is needed from us for making the following extract, which we present as an admirable illustration of our remarks. We purpose to quote the whole of the chapter on the above

subject, as we may have opportunity, and shall do so without abridgment; indeed, it would be difficult to abridge it without more or less considerably damaging the subject.

SECTION I.—*General view of the subject.*

When the malleable metals are hammered, or rolled, they generally increase in hardness, in elasticity, and in density or specific gravity; which effects are produced simply from the closer approximation of their particles, and in this respect steel may be perhaps considered to excel, as the process called hammer-hardening, which simply means hammering without heat, is frequently employed as the sole means of hardening some kinds of steel springs, and for which it answers remarkably well.

After a certain degree of compression, the malleable metals assume their closest and most condensed states; and it then becomes necessary to discontinue the compression or elongation, as it would cause the disunion or cracking of the sheet or wire, or else the metal must be softened by the process of annealing.

The metals, lead, tin, and zinc, are by some considered to be perceptibly softened by immersion in boiling water; but such of the metals as will bear it are generally heated to redness, the cohesion of the mass is for the time reduced, and the metal becomes as soft as at first, and the working and annealing may be thus alternately pursued, until the sheet metal, or the wire, reaches its limit of tenuity.

The generality of the metals and alloys suffer no very observable change, whether or not they are suddenly quenched in water from the red heat. Pure hammered iron, like the rest, appears, after annealing, to be equally soft whether suddenly or slowly cooled; some of the impure kinds of malleable iron harden by immersion, but only to an extent that is rather hurtful than useful, and which may be considered as an accidental quality:

Steel, however, receives by sudden cooling that extreme degree of hardness combined with tenacity, which places it so incalculably beyond every other material for the manufacture of cutting tools; especially as it likewise admits of a regular gradation from extreme hardness to its softest state, when subsequently re-heated or *tempered*. Steel therefore assumes a place in the economy of manufactures unapproachable by any other material; consequently we may safely say that without it it would be impossible to produce nearly all our finished works in metal and other hard substances; for although some of the metallic alloys are remarkable for hardness, and were used for various implements of peaceful industry, and also those of war, before the invention of steel; yet in point of absolute and enduring hardness, and equally so in respect to elasticity and tenacity, they fall exceedingly short of hardened steel.

Hammer-hardening renders the steel more fibrous and less crystalline, and reduces it in bulk; on the other hand, fire-hardening makes steel more crystalline, and frequently of greater bulk; but the elastic nature of hammer-hardened steel will not take so wide nor so efficient a range as that which is fire-hardened.

If we attempt to seek the remarkable

difference between pure iron and steel in their chemical analysis, it appears to result from a minute portion of carbon; and cast-iron, which possesses a much larger share, presents, as we should expect, somewhat similar phenomena.* Moreover, as the hard and soft conditions of steel may be reversed backwards and forwards without any rapid chemical change in its substance, it has been pronounced to result from internal arrangement or crystallisation, which may be in a degree illustrated and explained by similar changes observed in glass.

A wine-glass, or other object recently blown, plunged whilst red-hot into cold water, cracks in a thousand places, and even cooled in warm air it is very brittle, and will scarcely endure the slightest violence or sudden change of temperature; and visitors to the glass-house are often shown that a wine-glass or other article of irregular form, breaks in cooling in the open air from its unequal contraction at different parts. But the objects would have become useful, and less disposed to fracture, if they had been allowed to arrange their particles gradually, during their very slow passage through the long annealing oven or *leer* of the glass-house, the end at which they enter being at the red heat, and the opposite extremity almost cold.

To perfect the annealing, it is not unusual with lamp-glasses, tubes for steam-gauges, and similar pieces exposed to sudden transitions of heat and cold, to place them in a vessel of cold water, which is slowly raised to the boiling temperature, kept for some hours at that heat, and then allowed to cool very slowly: the effect thus produced is far from chimerical. For such pieces of flint-glass intended for cutting, as are found

	Contains one	150th of carbon.
* Iron semi-steelified		
Soft cast-steel capable of welding	120th	"
Cast-steel for common purposes	100th	"
Cast-steel requiring more hardness	90th	"
Steel capable of standing a few blows, but quite unfit for drawing	50th	"
First approach to a steely granulated fracture	30th to 40th	"
White cast-iron	25th	"
Mottled cast-iron	20th	"
Carbonated cast-iron	15th	"
Super-carbonated crude iron	12th	"

Musket's Papers, p. 256.

* For the mode of analysis for ascertaining the quantity of carbon in cast-iron and steel, invented by M. V. Regnault, Mining Engineer, see 'Annales de Chimie et de Physique' for January 1839; also 'Journal of the Franklin Institute', vol. 25, p. 327. It is stated that the analysis is very easy and exact, and may be completed in half an hour.

to be insufficiently annealed, the boiling is sometimes preferred to a second passage through the leer; lamp-glasses are also much less exposed to fracture when they have been once used, as the heat, if not too suddenly applied or checked, completes the annealing.

Steel in like manner when suddenly cooled is disposed to crack in pieces, which is a constant source of anxiety; the danger increases with the thickness in the same way as with glass, and the more especially when the works are unequally thick and thin.

Another ground of analogy between glass and steel, appears to exist in the pieces of unannealed glass used for exhibiting the phenomena formerly called double refraction, but now polarization, of light, an effect distinctly traced to its peculiar crystalline structure.

In glass it is supposed to arise from the cooling of the external crust more rapidly than the internal mass; the outer crust is therefore in a state of tension, or restraint, from an attempt to squeeze the inner mass into a smaller space than it seems to require; and from the hasty arrangement of the unannealed glass, the natural positions of its crystals are in a measure disturbed or dislocated.*

In the philosophical toy, the Prince Rupert's drop, this disruption is curiously evident to the sight, as the inner substance is cracked and divided into a multitude of detached parts, held together by the smooth external coat. The unannealed glass, when cautiously heated and slowly cooled, ceases to present the polarizing effect, and the steel similarly treated ceases to be hard, and may we not therefore indulge in the speculation, that in both cases a peculiar crystalline structure is consequent upon the unannealed or hardened state?

In the process of hardening steel, water is by no means essential, as the sole object is to extract its heat rapidly, and the following are examples, commencing with the

condition of extreme hardness, and ending with the reverse condition.

A thin heated blade placed between the cold hammer and anvil, or other good conductors of heat, becomes perfectly hard. Thicker pieces of steel, cooled by exposure to the air upon the anvil, become rather hard, but readily admit of being filed. They become softer when placed on the cold cinders, or other bad conductors of heat. Still more soft when placed in hot cinders, or within the fire itself, and cooled by their gradual extinction. When the steel is encased in close boxes with charcoal powder, and it is raised to a red heat and allowed to cool in the fire or furnace, it assumes its softest state; unless, lastly, we proceed to its partial decomposition. This is done by enclosing the steel with iron turnings or filings, the scales from the smith's anvil, lime, or other matters that will abstract the carbon from its surface; by this mode it is superficially decarbonized, or reduced to the condition of pure soft iron, in the manner practised by Mr. Jacob Perkins, in his most ingenious and effective combination of processes, employed for producing in unlimited numbers absolutely identical impressions of bank notes and cheques, for the prevention of forgery. These methods of treating steel will be hereafter noticed.

A nearly similar variety of conditions might be referred to as existing in cast-iron in its ordinary state, governed by the magnitude, quality, and management of the castings; independently of which, by one particular method, some cast-iron may be rendered externally as hard as the hardest steel; such are called *chilled-iron castings*; and, as the opposite extreme, by a method of annealing combined with partial decomposition, *malleable-iron castings* may be obtained, so that cast-iron nails may be clenched.

Again, the purest iron, and most varieties of cast-iron, may, by another proceeding, be superficially converted into steel, and then hardened, the operation being appropriately named *case-hardening*. I therefore propose to illustrate these phenomena collectively, under three divisions: first the hardening and tempering of steel; secondly, the hardening and annealing of cast-iron; and thirdly, the process of case-hardening.

(To be continued.)

* Mr. Pellatt has shown experimentally, that a rearrangement of the particles of glass occurs in the process of annealing, as of two pieces of the same tube each forty inches long, the one sent through the leer, contracted one sixteenth of an inch more than the other, which was cooled as usual in the open air. Tubes for philosophical purposes are not annealed, as their inner surfaces are apt to become soiled with the sulphur of the fuel; they are in consequence very brittle and liable to accident. For other interesting particulars concerning flint glass, see 'Minutes of Conversation, Inst. Civ. Eng.,' 1840, pp. 37 to 41.

TO PRESERVE THE ORIGINAL MODEL WHEN USING THE VULCANITE BASE.

To the Editor of the 'British Journal of Dental Science.'

SIR,—One of the great objections to the vulcanite base is the trouble that often results from the destruction of the original model. This may be obviated by the following plan, which has been adopted for some time past in Mr. Parkinson's workroom, at my suggestion, with the greatest success. Thinking it may interest some of your readers, and, perhaps, elicit further suggestions, I send you this account of it. After preparing the model in the usual way, as for gold work, by boiling in wax or stearine, make your plate as required of Ash's modelling wax, and mount the teeth, carefully preventing the wax from adhering to the model, which can be avoided by rubbing the model with French chalk, and removing it occasionally, to ensure its rising easily from it at the last. When the denture is completed, remove it entirely from the

model, and imbed it in plaster, taking care there are no air-bubbles underneath the wax, in the lower part of the flask, covering the cutting edges of the teeth with plaster, and then proceeding to close up the flask in the usual way. When the plaster is set, and the flask reopened, remove all wax with boiling water, and you will find a perfect duplicate of the model taken from the under surface of the wax plate, which you can then pack and vulcanize exactly as if you had the original model to work upon. When the piece is filed up and polished, it will be found to slip as easily on to the first model as any gold plate, or piece of bone, being free from undercuts; and any defect in the bite can thus be easily adjusted, so as materially to save the time of the operator with the patient. If I have not made myself sufficiently understood, I shall be most happy to show any gentleman my mode of working.

I am, sir, yours faithfully,
ROBERT BUTT, Jun.

169, Cambridge Street,
Pimlico.

Chemical Department.

PRACTICAL HINTS ON ELECTRICITY IN RELATION TO ELECTRO-PHYSIOLOGICAL APPARATUS. By J. N. HEARDEE, Electrician, Plymouth.

(Continued from page 119.)

ANÆSTHETIC AND THERAPEUTIC EFFECTS OF ELECTRICITY.

THE term anæsthesia, in the sense in which it is usually understood, is, it must be admitted, rather misapplied when used in relation to electro-physiological effects. Not that anæsthesia is not produced by electricity, but because certain effects have been termed anæsthetic which are more really the substitution of one sensation for another, or the occupation of a nerve so entirely with one class of sensation as to prevent the possibility of its recognising any other at the same time. It was, perhaps, for want of this distinction in terms that much of the misunderstanding and discussion arose between dentists as to the real

efficacy of electricity in alleviating or preventing the pain usually accompanying the extraction of a tooth.

The novelty of the application has now subsided, and dentists are able to form quiet and unprejudiced opinions as to its action. The result is, that whilst many still continue to employ it, others have abandoned the use of it, not because of the unsatisfactory character of the effects, but because of the trouble and inconvenience of keeping a machine always in order and ready for action, which in some instances, it must be allowed, was a matter of no small difficulty.

It is not the author's intention here to reopen the discussion of the possibility or impossibility of producing electrical anæsthesia. He has satisfied himself, by experiments on his own person, that anæsthesia and electrical sensation can coexist, that is to say, that a limb can be so perfectly under the control of electrical sensation as to be totally incapable of recognising operations, such as puncturing, &c., on the surface of

the skin. He would merely content himself by remarking that the most satisfactory mode of producing this effect is to employ a rapid series of exceedingly minute shocks or impulses, so as to approximate to the character of a continuous sensation, still maintaining the interruptions. In proportion as the succession of these shocks is slower, so he finds their individual intensity must be increased. But this alternative will not compensate for slower vibrations beyond a very limited point.

The author has before given it as his opinion that electricity might be employed by dentists with great advantage, both to themselves and their patients, as a therapeutic agent. Many a severe fit of tooth-ache may be at once relieved, and the tooth preserved for a future similar operation, by the application of electricity, although the patient may have, in a fit of despair, resolved on the last and apparently only alternative of getting once and for ever rid of the torment. His own experience with scores of such cases enables him to speak with great confidence, but of course the

dentist will immediately understand the class of cases thus likely to be relieved. The simple stimulation of a nerve by electricity is often sufficient at once to allay its irritability.

The physiological effects of the coil machine, whilst they bear a certain analogy to some of those produced by a simple battery series, without a coil, yet differ widely in others. In the coil machine the effects are due purely to discharges of static electricity, whereas the voltaic current is compound in its character, since it always produces chemical effects when passing through moist or fluid conductors. Thus it is that the terminals of an intensity battery, such as a Cruikshank's trough, a Wollaston's battery, a Pulvermacher's chain, or, indeed, any arrangement composed of a series of galvanic pairs, will produce chemical decomposition and positive disorganization of the tissues with which they are brought in contact, especially when the action is kept up for some time.

(To be continued.)

Hospital Reports and Case-Book.

To the Editor of the 'British Journal of Dental Science.'

SIR,—I am induced to communicate the following case, which came under my notice, as I believe it to be (if not unprecedented) one of very rare occurrence.

I was consulted, on the 20th of May last, by a young woman set. 21, who was anxious to have her two superior central incisors replaced. The crown of the left was completely decayed below the level of the gum, and about one third of the right was left standing, the pulp-cavity being intact. She informed me that about six years ago she had met with an accident, in which both of these teeth had been knocked out. She carried them in her hand to a surgeon, who replaced them, and they became quite firm, but from that time they had been gradually decaying. From the appearance of the remainder of the

tooth, and from the fact of its having been completely removed from its socket, I anticipated that the operation of cutting it down would be free from the usual amount of pain; but from the start my patient gave when the saw came to the centre of the tooth, it became evident that the pulp still existed. Upon examination, I found the pulp in a perfectly normal state, with the exception of its being rather smaller than is usual at that age. I also passed a fine broach a short way up the remainder of the left stump, and found that it contained the nerve, thus showing that a complete connection must have taken place between the separated vessels.

Apologising for trespassing thus far on your valuable space,

I remain, Sir,

Yours faithfully,

A. F. BAYNTON.

11, Dynevor Place,
Swansea.

British Journal of Dental Science.

LONDON, JULY, 1861.

IN a subsequent page we have reprinted a letter from the Council of the College of Dentists, and signed by its president, in answer to an article which appeared in the 'Lancet,' June 8th, a reprint of which appeared in the last number of this journal. We have also reprinted the list of the members of the College of Dentists published in the 'Transactions of the College of Dentists,' embracing the period from December 1860, to March 1861.

In placing these documents before them, we give our readers an opportunity of passing their own judgment upon the correctness of the opinions we have from time to time expressed, and also of testing the accuracy of the comments we are about to make upon this exceptional institution, the College of Dentists of England.

Considerable importance attaches itself to Mr. Waite's letter, in consequence of its formal and official character. If all the statements it contains can be substantiated, and a strict adherence to the truth in the letter as a whole, and in each of its parts, can be shown, the publication needs no justification. But if errors as respects matters of fact can be detected, or any attempted misrepresentation discovered, the council and its president will be condemned by their own deliberate act.

Mr. Waite classes the charges brought by the 'Lancet' against the College of Dentists under two heads, and his attempted refutation is placed under a similar arrangement, very loosely observed.

"In reply to the first of these charges, we beg unequivocally to state that the reading you have given against us, whoever may have advised you to it, is incorrect, both in principle and in fact. In

principle the position of the College of Dentists is the same as that of every other similar body; i. e., under certain conditions, fixed by laws agreed to by the majority, members are admitted to the College, and have certain privileges common to such admissions.

"On the second charge which your article conveys against us we have to make the following statements:—We are in every particular constituted as many other colleges—such, for instance, as the College of Preceptors, the Agricultural College, and the College of Civil Engineers."

The first of the preceding paragraphs describes the conditions under which private societies are formed, and to which, in its constitution, the College of Dentists is strictly analogous. Any half dozen dentists may form a similar body. The second paragraph contains a statement which is neither more nor less than totally erroneous. The College of Preceptors is a corporate body, and received its powers from a royal charter, granted March, 1849. The Royal Agricultural College was incorporated by a charter, granted March, 1845. Each of these institutions is governed by definite laws recognised by the legislature. Neither can extend its powers beyond those laws without the sanction of her majesty. The College of Dentists is not a corporate body; it has no legal existence; it has no fixed constitution; its laws may be altered from day to day to suit the caprice of the moment.

The College of Civil Engineers, Putney, has long since ceased to exist. The Institution of Civil Engineers was incorporated by royal charter, 1828, but is not an educational institution.

Hence the most important of the statements put forward in this letter from the Council of the College of Dentists ("We are in every particular constituted as many other colleges; such, for instance, as the College of Preceptors, the Agricultural College, and the College of Civil Engineers"), under investigation, turns out to be a complete fiction. The council has accepted the opportunity of proving before the profession its capabilities as a false witness, and fully justified the comparison made in the 'Lancet,' between the College of Dentists and the "Morrisonian Institute, or College of Health."

We may perhaps be told, that the comparison, which had for its object the elevation of the College of Dentists at the cost and degradation of the corporations named in the letter, was made in ignorance; but the plea of ignorance on such a subject cannot be accepted, from a knot of men who have occupied themselves for the last three or four years with apeing the powers of a corporated body. Disinterested measures, and laudable motives, when placarded for the purpose of shielding a false position, may fail to deceive; and those who have hitherto had some leaning towards the College of Dentists, on discovering the nature of the present display, will turn away in disgust.

"Our members and associates (says Mr. Waite) number over 160, are distributed over all parts of England, and have a position scientific and social not inferior to others of the profession." Of the value of the latter statement our readers can form their own estimate, on referring to the list. The College list gives 135 members (assuming for the moment that the list can be depended on), and thirty-two associates who are not dentists in practice. They are for the present employed artisans, or apprentices only, and can be compared with the members of no other association. Presiding over 135 members, we would ask, is Mr. Waite justified in speaking in the following terms of those who, to the number of 131, have, after examination, received the

dental diploma of the College of Surgeons? "We turn to the few men who have taken the dental certificate of the College of Surgeons." Is it consistent with candour, or even truth, to designate 131 by the term "few," when the members of the institution he is endeavouring to uphold number 135? Is not such a statement calculated to mislead the readers of the 'Lancet;' and when exposed to throw discredit, not only upon Mr. Waite's statement, but upon the dental profession generally? Mr. Waite is probably aware, that the College list contains the names of eleven gentlemen who have obtained, within the last eighteen months, the dental diploma from the College of Surgeons. Of these, four joined the College of Dentists in 1856, five in 1857, one in 1859, and one in 1860. If the College is justified by their laws in retaining the names of these gentlemen in their list of members, can those who have gone elsewhere for their qualification be accounted warm supporters of the College of Dentists? Does the president, when he talks of the social and scientific position of his members, bear in mind the notable fact, that of the seventeen dentists who hold appointments at the general hospitals of London one only is an adherent of his college, that thirteen hold the dental diploma of the College of Surgeons, that three have attached themselves to neither of the dental movements?

With these facts before him, can Mr. Waite justify the title President of the College of Dentists of England? Does he really think he is the representative of the dentists of England; and that, in his letter to the 'Lancet,' he is speaking for them to the members of the medical profession? Does he consider that the support of 135, thirty of whom are more or less distinguished as advertising dentists, justifies him in assuming to preside over the dentists of England, who are known to number upwards of 1000, the most eminent of whom are enrolled in a society numbering 180 members opposed to the College of Dentists of England? Does it never occur to him, that the

position is false, that the College of Dentists of England is a title indicating the existence of an institution which has no real existence; that the sham which takes its place and pretends to be it, is maintained by an infinite amount of touting; that if the advertising members were turned out, or, if the medical men connected with it as lecturers were withdrawn, the College of Dentists, like the College of Civil Engineers at Putney, would vanish. Does it not occur to him, that he is bound hand and foot; that, according to his own showing, the advertising element in his College is too strong for him to rule it; that the necessities of existence forced him to accept the support of men of newspaper notoriety, and forced him to give his signature to the letter we have reprinted from the 'Lancet,' which letter leaves the College of Dentists in a worse condition than before, inasmuch as the recourse to falsehood is a practical admission, on the parts of the Council of the College of Dentists, that misrepresentation is necessary to the existence of the institution.

Failing to acquire a respectable position, it is but a stale trick for the unsuccessful to throw dirt upon the objects of envy, with the hope of dragging them down to the same level of inferiority. We are tolerably well acquainted with dental advertisements, and we have seen one emanating from a dentist holding the dental diploma of the College of Surgeons, and this was associated with a change of residence. But, among the advertisements placed before us, we have seen thirty emanating from members of the College of Dentists. Mr. Waite says:—"We turn to the few men who have taken the dental certificate of the College of Surgeons, and we find even amongst these, who have been arbitrarily and specially selected by the Council, men who continually advertise and issue bills."

It is very strange that we should not have fallen upon the advertisements of these *men who continually advertise*, when those inserted in the newspapers by the members of the College of Dentists meet us at every

turn. The explanation probably lies in the fact, that the College of Surgeons have been successful in declining to admit to examination those dentists who, by the use of professional advertisements, violate the canons of professional conduct, and that Mr. Waite has seen the one example to which we have alluded.

The discouragement of the advertising system forms the only ground upon which Mr. Waite can charge the College of Surgeons with arbitrary selection; but we cannot accept Mr. Waite's objection as sincere, while the exclusions on the part of the College of Surgeons adds to the list of his supporters. But for this arbitrary selection, Mr. Waite would not have the opportunity of accepting the co-operation of some of the gentlemen who advertise consultations free, &c. But for the example before us, we should have thought it beneath the dignity of a president to affix his signature to the paragraph we have quoted, in which arbitrary and special selection is made to take the place of a correct statement, which would have described exclusion of advertisers, and the grant of diplomas to candidates after satisfactory examinations.

Again, in this marvellous letter, we are told:—"Unfortunately, on looking for any precedent, we have found none. We compare ourselves, for instance, with the College of Surgeons, and we find that amongst the members of that body there are several of the most systematic advertisers in England."

A private society cannot be compared with a corporate body. The former can exclude whom it chooses. The latter is bound to observe the laws embodied in its charter of incorporation. But waiving this incongruity, let us see how matters stand. The College of Surgeons has over 14,000 members. A few advertise, and a very few indeed, when considered in connection with the size of the constituency. The College of Dentists has 185 members, thirty of whom advertise more or less. In order to justify the comparison, it should be shown that the number of advertising members of

the College of Surgeons approaches 3,000. Is Mr. Waite prepared to show that even 800 advertise, that a sufficient number advertise to exercise any appreciable effect of any kind upon the general body of members! Will not our readers say, that this is but another attempt to lower the position of the members of the College of Surgeons for an unworthy purpose?

The 3000 medical men are again paraded before us; but any allusion to the fact, that their support was gained by a hollow *ex parte* statement, supported in many cases by a personal canvas, is carefully avoided.

The allusions to honour and good faith,

contained in the last paragraph of this letter, of misrepresentations, are peculiarly rich; and, but for the discredit reflected upon the dental profession by the use of such language, might, as the climax of the official performance, form the subject of a hearty laugh. All will, however, agree with us, that it is deeply to be lamented that a profession highly useful to the public and honourable to its representatives, should be subjected to the degradation which is entailed in the publication of falsehoods by a body of men pretending to represent the dentists of England.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

DENTAL APPOINTMENTS AT MILITARY HOSPITALS.

*To the Editor of the 'British Journal of
Dental Science.'*

SIR,—Feeling much interest in the question of public dental appointments, I have taken the trouble to collect all the statements made in reference to the subject by the 'Dental Review' and yourself; the result was such a tissue of contradictions, that to settle the question, for my own satisfaction at least, I applied direct to the Medical Director-General of the Army. A copy of my note, with the official reply, I now send you appended to my collection of extracts.

I am, Sir,

Yours faithfully,

CHARLES JAMES FOX.

(1.)

*From the 'Dental Review' of February,
1861, p. 71.*

"The Dental College is gradually gaining strength; the number of its members is increasing; its certificate of membership is publicly recognised, and the possession of it is felt to be a guarantee of the fitness of candidates for public appointments."

(2.)

*From the 'Dental Review,' of March, 1861,
p. 139.*

"APPOINTMENT.—We have much pleasure in announcing that J. Cox Smith, Esq., M.C.D.E., of Maidstone, has been recently appointed dentist to the Government Hospital of Fort Pitt, Chatham.

We believe this is the first dental appointment to a Government institution made in this country, and it is gratifying to find that it has been bestowed on a member of the College of Dentists, and one who has been so active in the cause of professional reform as Mr. Smith."

(3.)

*From the 'Dental Review' of April, 1861,
p. 158.*

"As the representatives of the only free and independent Dental press of this kingdom, we ought not to be behind our Medical compeers in heartily congratulating the liberal and earnest members of our body on two notable triumphs which they have recently achieved. It has often been thrown out as a sneer and a by-word against the Institution which is the centre of an independent Dental policy in England (we mean, of course, the College of Den-

tists) that, from its being as yet unchartered, it could rank as nothing in the social scale; that its Certificate, though gained by honorable competition, could prove of no avail, and that the failure of the College would turn on the circumstance that the public bodies of this kingdom, having important appointments in their hands for disposal, would cast the College aside as something unrecognisable, however good, because it was not gifted with a charter, conferring specific privileges.

We waited patiently for results, and results have now come which have fully satisfied us: precedents have been given, and recognitions made to which we refer, as we may well, without boasting, but with sincere gratification. In the first place, the Government itself had an appointment for a Dentist. It has filled up that appointment by the election to the trust of Mr. Cox Smith of Chatham, now Dentist to the Fort Pitt Establishment. In making this selection, our authorities have done at once a wise and a liberal act: they have elected a first-class practitioner, and, therefore, they are wise; they have elected a staunch defender of the independent section of Dentists, and, therefore, they are liberal as well as wise. The precedent is worth a charter: it is a tacit recognition of right by the highest authorities in the realm."

(4.)

From the 'British Journal of Dental Science,' May, 1861, p. 121.

"An announcement of the alleged dental appointment at Fort Pitt, Chatham, we have failed to discover in the 'London Gazette,' where all appointments to military institutions, ranging above the grade of those held by non-commissioned officers are made public, and the suspicion that no such appointment had been made is fully justified by information we have received. the correctness of which does not admit of doubt."

(5.)

From the 'British Journal of Dental Science,' June, 1861, p. 147.

"To the Editor of the 'British Journal of Dental Science.'

"Sir,—My attention has been directed to a paragraph in the last number of the 'British Journal of Dental Science,' having reference to the appointment of a dentist

to Her Majesty's Hospital, at Fort Pitt, Chatham.

It was perfectly unnecessary for the writer to seek information from private sources respecting business connected with the public service. The Director General of the Army Medical Department, or the principal medical officer at Fort Pitt, would have supplied it, and the misstatement would have been avoided.

By the insertion of this you will oblige
THE DENTIST TO THE HOSPITAL.

"Maidstone;

"June 5th, 1861."

(6.)

"[The absolute correctness of our information renders it quite unnecessary that we should trouble the Director General of the Army Medical Department to affirm the negative published in the last number of this Journal. We again state that no dental appointment has been made at Fort Pitt—that a dental officer has not been appointed to that hospital. If we are wrong, our error will be readily proved by 'The Dentist to the Hospital' publishing in this or any other journal the official document which must have been addressed to him by the head of the Medical Department, and under which he holds his appointment as Dentist to Fort Pitt Hospital. The production of the official document conferring the appointment, in the absence of any notification of the appointment in the government organ—the Gazette—is the only evidence that can be accepted in favour of the assertion that a dental appointment has been made at a government hospital. It is for those who assert a position to prove by positive evidence the correctness of their statements, should they be called in question. It remains for 'The Dentist to the Hospital' to show that he has received an appointment in Her Majesty's service.—Ed. 'B. J. D. S.']"

(7.)

From the 'Dental Review,' July, 1861, p. 810.

"The appointment of Mr. J. Cox Smith, as Dentist to Her Majesty's Military Hospital of Fort Pitt, Chatham, appears to be regarded with uneasy feeling by our contemporary, who lately stated, on the strength of "private information," that there had been no such appointment made. In the last number of the 'British Journal of Dental Science,' Mr. Smith, in a note

addressed to the Editor, tells him that he could have obtained information of a contrary nature by applying to the Director-General of the Army Medical Department, or to the principal Medical Officer at Fort Pitt. The Editor appends to Mr. Smith's note some lengthy and most uncourteous remarks of his own, calling on Mr. Smith to prove that he holds the appointment. Surely, after Mr. Cox Smith's previous assertions, it is for the Editor to prove that he has it not.

"As the matter stands at present, Mr. Cox Smith, on his own testimony, is Dentist to Fort Pitt: on the Editor's testimony he is not. The one is a gentleman known to us all; the other, a writer whose previous false statements have been sufficiently often exposed. The Profession will not be at a loss to judge between the two."

(8.)

(Copy.)

To the Director General of the Army Medical Department.

27, Mortimer Street, Cavendish Square;
July 6th, 1861.

SIR,—A question of fact having arisen as to the appointment of a dentist to a military hospital, and as the subject is one of great interest and importance to dentists, may I beg that you will inform me whether a dental appointment has been made at Fort Pitt or any other military hospital?

I have the honour to be,

Sir,

Yours obediently,

CHARLES JAMES FOX.

(9.)

To Charles James Fox, Esq.

(Medical.)

ARMY MEDICAL DEPARTMENT;
11th July, 1861.

SIR,—In acknowledging the receipt of your letter of the 6th instant, I have the honour to inform you that no dental appointment has been made to Fort Pitt, or any other military hospital; but the principal medical officer at Chatham has been informed that he is at liberty to request the services of a gentleman residing at Chatham in any case that he may think necessary.

I have the honour to be,

Sir,

Your most obedient humble servant,

J. GIBSON,

Director-General.

To the Editor of the 'British Journal of Dental Science.'

SIR,—I have often thought that the body of men who, under the inflated title of "The College of Dentists of England," presume to represent the dental profession of this country, might just as well tell us who they are, as leave us in an Egyptian darkness upon so important a subject. Their "organ" has been made to amuse us with everything except this; but even the comic element, so prevalent in its monthly performances, has not atoned for so grave an omission. It would be very much better, however, for them to emerge from this obscurity, and show face in the broad light of day. Surely such an institution is of too solid and substantial a character to fear investigation and analysis! It cannot be that it will not bear scrutiny. Who would be profane enough even to dream of such a thing? True, we have been allowed to know something of its officers, and I doubt not that the profession at large has been more than satisfied with their qualifications from the gentleman at their head all the way down to the fortunate possessor of the continental degree of M.A.Ph.D. But you are aware, sir, that every rule has its exception, and I am that exception here. I am presumptuous enough to desire to be informed who the men are who stand between me and the public, as my representatives. I require to know of whom this "quasi" college is composed, which has thought proper to usurp that position. To all inquiries, however, in the legitimate direction, is opposed an ominous silence. What was to be done? "If you want a thing done, do it yourself," is my motto, and I have acted upon it in this particular instance. I have laid what I suppose will be called "sacriligious hands" upon this body, with the horrid intention of exposing it to the public view. Of course I am fully prepared to bear the "anathemas" which will be hurled at me, and have arranged for a certain number of sleepless nights and restless days, but the desire to unwind the shroud which enveloped this mysterious fraternity was stronger than my prejudice against narcotics (which must certainly follow), and urged me to the task.

Now, sir, you are aware that there are some 1200 or 1400 dentists practising in Great Britain and Ireland, and, judging from a glance at their past transactions, I apprehend that the representative capacity of this same college in its caoutchouc com-

prehensiveness extends over the three kingdoms, embracing in its elastic grasp the Land's End and John O'Groats, and tucking the Emerald Isle under its thumb. Whether or not, what will the body of dentists say when they hear that the College of Dentists of England has but 184 members, nearly 100 of whom are practising in the country, the remainder in London, and that twenty-five out of the *grand* total hold their variegated certificate by examination? Verily, there is nothing like a good stock of presumption, and were the funds of this institution commensurate with their stock of this article, I should completely despair, for there would be then no chance of its ever coming to an end. Cast your eye down the list of officers, and your heart must beat with proud emotion as you remember what they have one and all done to advance their profession as *dentists*—their retiring and modest deportment before their brother practitioners and the public; their anxiety to retain office for the sole good of the cause; their eagerness to exemplify the martyr spirit, and prove how far true devotedness and self-denial could go. I doubt not you and your readers are profoundly thankful for all this, but I see an omission which must have escaped the council, and therefore I hasten to make it good. They have forgotten to tell us who the gentlemen are who, from their influential numbers, find so little difficulty in furnishing the College with its illustrious staff. They have omitted to show us the massive ore from which these brilliant particles have been taken. I therefore trust that you will fully recognise the service I am rendering in submitting to you the following list, and if I meet with encouragement, you shall receive the balance-sheet, with a few remarks thereon, as it is reported in the college 'Transactions' for the session of 1860-1, in time for your next impression.

I am, sir,

Yours, &c.,

INQUIRER.

COLLEGE OF DENTISTS OF ENGLAND,

5, Cavendish Square.

PRESIDENT.

GEORGE WAITE, Esq.

VICE-PRESIDENTS.

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WILLIAM IMRIE, Esq.
NORMAN KING, Esq.
JAMES MERRYWEATHER, Esq.
JAMES ROBINSON, Esq.
E. ROSE, Esq.
SOMERSET TIBBS, Esq.

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REGISTRAR.

FELIX WEISS, Esq.

List of Members and Associates.

MEMBERS.

Date of
Membership.

1857. ALABONE, ALFRED,
High street, Newport, Isle of Wight.
1860. ALLSHORN, GEORGE EDWARD,
George street, Edinburgh.
1860. ALLSHORN, WILLIAM CHARLES,
George street, Edinburgh.
1857. ATKINSON, JAMES HENRY,
East Parade, Leeds.
1857. BELISARIO, JOHN,
Sydney, New South Wales.
1856. BELLABY, GOODMAN WOOD,
Derby road, Nottingham.

Date of Membership.	Date of Membership.
1857. BEYERS, EDWIN, Broad street, Oxford.	1856. FOTHERGILL, WILLIAM, Northgate, Darlington.
1857. BOULGER, JOSEPH PATRICK, Willow lane, Norwich.	1860. FOWLER, CHARLES JEVONS, High street, Gloucester (by examination; April 26, 1860).
1857. BRENNIS, DANIEL J., Cavendish square.	1857. FRANKLIN, GEORGE PAUL, Westbourne grove, Baywater.
1861. BROCK, JOHN, Berners street, Oxford street (by examination, January 17, 1861).	1857. GAMBLE, J. G., Stratford-on-Avon, Warwickshire.
1857. BROOKS, ROBERT HEYGATE, Banbury, Oxford (by examination, October 31, 1860).	1857. GARNETT, HENRY JOSEPH, Norfolk row, Sheffield.
1859. BULLIN, FREDERICK, Whitefriars, Chester.	1857. GARRATT, P. L., Athol street, Douglas, Isle of Man.
1860. CAMERON, THOMAS R., St. James' street, Paisley.	1860. GIBBS, FREDERICK, Pentonville road.
1856. CAMPBELL, WALTER, Tay square, Dundee.	1857. GRANT, WILLIAM, Church street, Inverness.
1856. CANTON, WILLIAM LAURENCE, Hanover street, Hanover square (by examination, October 31, 1860).	1856. GREENFIELD, HENRY, Mortimer street, Cavendish square.
1858. CARTER, EDWIN, Barnsley, Yorkshire.	1859. HANKINS, THOMAS, Great Pulteney street, St. James's (by examination, April 26, 1860).
1857. CARTER, JOHN HENRY, South Parade, Wakefield, Yorkshire.	1858. HARDING, GEORGE, East street, Chichester.
1858. CHAPMAN, WILLIAM, Maddox street, Regent street (by examination, October 31, 1860).	1857. HARDING, THOMAS HENRY, Park square, Regent's park.
1860. COMLEY, WILLIAM, Brunswick Cottages, Stoke Newington.	1857. HARRINGTON, GEORGE FELLOWES, Sedgeley House, Ryde, Isle of Wight.
1861. COX, NATHANIEL GILBERT, Antigua, West Indies (by examination, April 11, 1861).	1861. HARRIS, HASLAR, Gower street, Bedford square.
1856. DAGNALL, EDWARD, Oak terrace, Bridge road, Battersea.	1856. HAYMAN, JOHN GRIFFIN, Cumberland street, Bristol.
1857. DUBOIS, ADOLPHUS, Charlotte street, Fitzroy square.	1856. HAYMAN, SAMUEL AUGUSTIN, Cumberland street, Bristol.
1857. DOBIE, JAMES, High street, Paisley.	1858. HEATH, THOMAS WEATHERHEAD, Church terrace, Richmond.
1861. DURANDER, JOHN, Clarence street, Everton, Liverpool.	1859. HENRY, GEORGE, Wimpole street, Cavendish square (by examination, April 11, 1861).
1860. DURANT, FREDERICK, High street, Dorking.	1856. HOOKLEY, ANTHONY, Princes street, Hanover square (by examination, May 31, 1860).
1857. FERGUSON, JAMES H., Albert street, Sligo, Ireland.	1856. HOPKINSON, WILLIAM, Broughton road, Salford, Manchester.
1856. FINZI, SAMUEL LEON, York place, City road (by examination, October 31, 1860).	1858. HORNE, JAMES, Douglas street, Blythewood square, Glasgow.
1856. FOTHERGILL, ALEXANDER, Northgate, Darlington.	1857. HOWLDEN, WILLIAM HENRY, Coney street, York.

Date of
Membership.

1861. **HUET, FRANÇOIS ALEXANDER**,
Darlington street, Wolverhampton (by
examination, April 11, 1861).
1857. **HUGHES, JAMES AUSTIN**,
Hamilton square, Birkenhead.
1859. **HULME, ROBERT T.**,
John street, Bedford row.
1856. **IMBIE, WILLIAM**,
Savile row, St. James's.
1857. **JONES, ALFRED**,
Gothic House, Trumpington street, Cam-
bridge.
1857. **KARRAN, JAMES**,
Edward terrace, Douglas, Isle of Man.
1856. **KELLY, THOMAS MARK**,
Chatham street, Piccadilly, Manchester.
1857. **KEMPTON, HENRY T.**,
Princes street, Hanover square (by exa-
mination, April 26, 1860).
1856. **KING, NORMAN**,
Bedford circus, Exeter.
1858. **LAW, THOMAS K.**,
Santiago, Chili.
1856. **LITTLE, STEPHEN**,
Cumberland street, Bristol (by examina-
tion, October 31, 1860).
1858. **LLOYD, FRANCIS ROBERTUS**,
Agra, India.
1857. **LLOYD, GEORGE FIELDHOUSE**,
Gallowtree gate, Leicester.
1857. **LOWE, ANDREW**,
Lowther street, Carlisle.
1860. **MACKINTOSH, JAMES**,
Rankellor street, Edinburgh.
1860. **MACKINTOSH, RICHARD CORDEN**,
Rankellor street, Edinburgh.
1859. **MACKINTOSH, WILLIAM**,
St. Stephen's green, Dublin.
1858. **MARGETSON, WILLIAM**,
Roscoe place, Dewsbury, Yorkshire.
1856. **MERRYWEATHER, JAMES**,
Brook street, Grosvenor square.
1857. **MORRISON, JAMES DARSIE**,
Queen street, Edinburgh.
1858. **MOSELY, BENJAMIN LEWIS**,
Whitefriars gate, Hull, Yorkshire.
1857. **MOSELY, GILLAM**,
Bath buildings, Sheffield.
1856. **MOSELY, SIMON**,
Whitefriars gate, Hull, Yorkshire.

Date of
Membership.

1856. **NEEP, EDWARD**,
Post-office street, Norwich.
1857. **NEWMAN, WILLIAM JOHN**,
Great George street, Liverpool.
1859. **NIGHTINGALE, DANIEL THOMAS**,
New Bridge street, Newcastle-on-Tyne.
1856. **PATRICK, ROBERT**,
Silverwell House, Bolton-le-Moors.
1861. **PAYNE, THOMAS PIBBLE**,
Sussex terrace, Southampton (by examina-
tion, January 25, 1861).
1860. **PEARCE, WILLIAM**,
Trinity road, New Town, Bristol.
1859. **PENNEY, JAMES**,
Silver street, Lincoln.
1856. **PERKINS, HENRY J.**,
York place, City road.
1856. **PERKINS, WILLIAM**,
Prospect place, Maida hill (by examina-
tion, May 31, 1860).
1861. **PHILLIPS, THOMAS**,
Davies street, Berkeley square.
1859. **PIKE, JAMES LEE**,
Academy street, Dumfries.
1857. **PILLING, ROBERT CAMPBELL**,
King William street, Blackburn.
1857. **PORTER, WILLIAM PRATT**,
Finsbury place, South, Finsbury square
(by examination, May 31, 1860).
1856. **PURLAND, THEODOSIUS**,
Mortimer street, Cavendish square.
1861. **RANSOM, DENIS WILLIAM**,
Pembroke place, Liverpool.
1856. **ROBERTSON, JAMES**,
Edgar buildings, Bath.
1856. **ROBINSON, JAMES**,
Gower street, Bedford square.
1857. **ROSE, JAMES EDWARD**,
Mount Pleasant, Liverpool.
1857. **ROSE, JOHN FREDERICK**,
Fishergate, Preston.
1856. **BUNTING, WILLIAM**,
South Audley street, Grosvenor square
(by examination, January 17, 1861).
1856. **RYMER, SAMUEL LEE**,
North End, Croydon (by examination,
May 31, 1860).
1857. **SAYLES, FRANÇOIS A.**,
Silver street, Lincoln.

Date of Membership.	Date of Membership.
1857. SCHOLEFIELD, JAMES, South street, Huddersfield.	1857. WAINWRIGHT, JOHN, Bridge road, Harrow road.
1859. SHIELDS, WILLIAM JAMES, South Mall, Cork.	1859. WAITE, GEORGE, Old Burlington street, St. James's.
1860. SHORTT, JOHN, Madras Army.	1856. WAYLING, GEORGE, Whiting street, Bury St. Edmund's (by examination, January 17, 1861).
1857. SIMS, FREDERICK JOHN, Colmore row, Birmingham.	1857. WEAVER, GEORGE, Upper Baker street, Regent's park (by examination, May 31, 1860).
1860. SKARDON, JOHN, Melbourne, Australia.	1856. WEISS, FELIX, Great Russell street, Bloomsbury square (by examination, May 31, 1860).
1858. SLATER, JOHN MCQUOID, Albion street, Hanley, Staffordshire.	1856. WEST, BYATT, Old Broad street, City.
1856. SMALE, HENRY, Great Marlborough street.	1856. WEST, JOHN T. H., Old Broad street, City.
1856. SMART, JOHN SHERRARD, Park street, Bristol.	1857. WILLIAMS, EDWIN, Malvern, Worcestershire.
1857. SMITH, JOHN COX, Brewer street, Maidstone.	1856. WILLIAMS, GEORGE JOSEPH, Ladbroke road, Notting hill (by examination, April 26, 1860).
1856. SNAPE, JOSEPH, Lower Bridge street, Chester.	1859. WILKINS, BUTLER, St. Giles's square, Northampton.
1856. SPENCER, HARRY LYUS, Orchard street, Portman square (by examination, October 31, 1860).	1856. WINTERBOTTOM, EDWIN JOHN, Sloane street, Chelsea.
1856. STODDART, CHARLES, Connaught terrace, Edgware road.	1857. WINTERBOTTOM, EDWIN JOHN, JUN. Sloane street, Chelsea.
1857. STOKES, HENRY COLIN, Blackett street, Newcastle-on-Tyne.	1857. WOTTON, J. D., Francis street, Ferris Town, Truro, Cornwall.
1857. SUTCLIFFE, JAMES, Drewton street, North Parade, Bradford (by examination, October 31, 1860).	1856. WOOD, WILLIAM ROBERT, Carlisle House, Brighton (by examination, April 26, 1860).
1856. THOMSON, FRANCIS HAY, Brandon place, Glasgow.	1857. WOODBURN, WILLIAM DESBREISAY, South Portland street, Glasgow.
1856. THOMSON, ROBERT, Denmark hill, Camberwell.	1860. YOUNG, JAMES ANDERSON, Bath street, Glasgow.
1856. TIBBS, SOMERSET, Regent street, Cheltenham.	1856. YOUNG, JAMES HAMILTON, Dundas street, Glasgow.
1857. TUCK, WILLIAM B., Camborne, Cornwall.	
1856. TURNER, JAMES SMITH, Margaret street, Cavendish square.	
1861. TWEED, ROBERT, St. John's street, Colchester.	
1857. VERNON, WILLIAM FRANCIS, Princes street, Edinburgh.	
1860. VERRIER, A., St. Petersburg.	
1859. VIDLER, THOMAS COLLINS, Eastbourne terrace, Hyde park (by examination April 26, 1860).	

ASSOCIATES.

1861. BELSEY, R.,
Borough road, Southwark.
1861. BRADLEY, WILLIAM,
Woburn place, Russell row.
1857. BOWMER, GEORGE,
Haywood street, Sneinton, Nottingham.
1860. BUCK, THOMAS,
Tottenham-court road.

- Date of Membership.
1860. COLES, JAMES,
Bedford street, Bedford row.
1859. CUNNINGHAM, JOHN THOMAS,
Lonsdale square, Islington.
1859. DRISCOLL, JOHN,
Drake street, Red Lion square.
1861. FARO, HENRY,
Norland square, Kensington.
1860. GREENFIELD, G.,
Mortimer street, Cavendish square.
1861. GREENING, CHARLES GEORGE,
Edward terrace, Caledonian road, Islington.
1859. HALSEY, RICHARD,
Edgware road, Paddington.
1856. HANCOCK, E. J.,
Henry street, Vauxhall.
1860. HARRISON, RICHARD,
Camden street North, Camden Town.
1857. HOLMES, THOMAS M.,
Bond street, Hull.
1857. HOOLE, STEPHEN,
Gillingham street, Pimlico.
1860. JACKSON, T.,
High street, Camden Town.
1856. JORDAN, A.,
Prospect Cottage, Hornsey.
1857. JORDAN, G. H.,
Florence villas, Wood green, Tottenham.
1857. LEATHERBY, W. L.,
Pitville, Cheltenham.
1857. NEWMAN, A.,
Slater street, Liverpool.
1857. NEWMAN, H.,
Slater street, Liverpool.

- Date of Membership.
1857. ROGERS, R.,
Toriano grove, Camden Town.
1856. SALTON, ALBERT,
St. Ann's road, Notting hill.
1858. STUCK, FREDERICK,
Queen's road, Bayswater.
1859. STUCK, WILLIAM,
High street, Marylebone.
1857. VERNON, WILLIAM FRANCIS,
Meredith street, Clerkenwell.
1860. WEBSTER, RIDLEY ROBINSON,
Gower street, Bedford square.
1857. WHITE, HENRY,
Butchery street, Lincoln.
1857. WOOD, J. W.,
Carlisle house, Brighton.
1860. WOOD, W. E., Jun.,
Carlisle house, Brighton.
1857. WOODBURN, W. S.,
South Portland street, Glasgow.
1860. ZINKGRAFF, FREDERICK,
Cavendish square.

To the Editor of the 'British Journal of Dental Science.'

SIR,—Please do me the favour to inform Mr. Bridgman, through your Journal, that I did not at all intend to imply that his views were not original when I stated that they appeared to me like those suggested in Mr. Tomes's lectures.

Yours, &c.,

ALFRED COLEMAN.

3, Finsbury Square.

Literary Notices and Selections.

THE COLLEGE OF DENTISTS.

To the Editor of the 'Lancet.'

(From 'The Lancet,' June 22d, 1861.)

SIR,—In the number of the 'Lancet' of the 8th instant, an article appears in the "Medical Annotations," directed against the College of Dentists. The same article

appearing in a less influential journal might have been allowed to pass unnoticed, but as occurring in the 'Lancet,' and as conveying a series of charges, which, if uncorrected, might mislead a large class of readers, the Council of the College of Dentists has requested me, as President of the College, to forward to you the following answer. We have striven in

this reply to meet every point adduced against us temperately and fairly, in a way as shall become us as men who have been misunderstood and misrepresented, and who, conscious of such misconstruction, would set themselves properly before the public. We feel confident that your sense of justice will grant us the privilege of this defence.

The article to which we refer sets against us two charges:—1st. That we are disposing of certificates from our institution to advertising dentists, in such a way as to enable them, by assuming membership with us, to pass themselves off as something more than usually eminent in their profession. 2d. That by our proceedings, we are not advancing, but, on the contrary, degrading our profession, and this to such an extent as to make our institution the analogue of a notorious charlatanic establishment conducted by a single family for the sale of a patent nostrum which you have designated.

In reply to the first of these charges, we beg unequivocally to state that the reading you have given against us, whoever may have advised you to it, is incorrect, both in principle and in fact. In principle the position of the College of Dentists is the same as that of every other similar body; *i. e.*, under certain conditions, fixed by laws agreed to by the majority, members are admitted to the College, and have certain privileges common to such admissions. They can attend all meetings, vote in election of officers, have the use of the library, and the like. From the first moment when the College was opened (not opened, be it observed, by "a knot of men who recently clubbed together," as your article says, but by the voice of a large body of dentists, expressed at a meeting publicly convened nearly five years ago—see the 'Lancet' for Sept. 27th and Nov. 15th, 1856), laws were specially made for excluding from membership every man who in any way could be considered as guilty of practising his profession in a quackish and dishonorable manner, and these laws we can state implicitly have not only been rigidly adhered to, but have, from time to time, been revised and made more stringent. Thus, at the present time, the following conditions are those acted upon in relation to the election of members:—1st. The candidate must transmit a paper declaring he does not advertise contrary to the rules of the College. 2d. A paper, signed by four

members of the College, or by medical men, that he is a fit person to be admitted. 3d. He must sign a paper, declaring he will adhere to the laws of the College. We admit, nevertheless, that notwithstanding the stringency of these rules, it has happened, in a few instances, that certain persons who have taken up our membership have proceeded in a way this Council entirely condemns, and the best mode of dealing with these individuals has often been matter for discussion by the Council.

Sir, we are sure that you will admit with us, that various and extreme difficulties beset the question which has thus been brought before us. Unfortunately, on looking for any precedent, we have found none. We compare ourselves, for instance, with the College of Surgeons, and we find that amongst the members of that body there are several of the most systematic advertisers in England. We turn to the few men who have taken the dental certificate of the College of Surgeons, and we find even amongst these, who have been arbitrarily and specially selected by the Council, men who continually advertise and issue bills. We see that the College of Surgeons takes no note of these men, and, indeed, it is currently believed that legally it can do nothing. We are not different to the College of Surgeons, but instead of being passive, we have ventured to act. Within this very year, for instance, we have struck off our roll the names of two members, and have refused membership to three others who have applied to us for election, because they were advertising in a manner not permitted by our laws.

On the second charge which your article conveys against us we have to make the following statements:—We are in every particular constituted as many other Colleges—such, for instance, as the College of Preceptors, the Agricultural College, and the College of Civil Engineers. Our members and associates number over 160, are distributed through all parts of England, and have a position, scientific and social, not inferior to others of the profession. In carrying out our principles we have done everything in our power for the establishment of a scientific collegiate body. Thus, we have in the five years of our existence had delivered eleven distinct courses of lectures from men who, by position and practical knowledge, were best fitted for the task. We have inaugurated

a school for systematic instruction in dentistry and the collateral sciences for our junior brethren. We have published four yearly volumes of 'Transactions,' which have been largely reprinted and circulated both in this country and in America. We have opened a reading-room, library, and museum. We have appointed committees to investigate special scientific questions. We have instituted liberal prizes for the promotion of dental science, and we have provided during the session for monthly discussions and readings. Finally, to give our membership more value, we have lately originated a system of admission of members by examination, the Examining Board having been selected with all the judgment we could bestow upon the selection.

We ask you, Sir, in fairness, could we do more, or work in any better or safer path? Is there in these progressions one single deviation from the strictest scientific orthodoxy and principle? Of our political views we do not speak on this occasion, except to say that which we profess we conscientiously believe to be the best for the public, the profession of medicine, and the profession of dentistry. Nor are we alone in this belief; for when in the beginning of 1860 we appealed to the medical profession, in England putting our own position, indeed, in the hands of the medical body, the large number of 8000 gave us their suffrages, and bade us go on.

Anxious to these gentlemen, not less than to yourself, Sir, to vindicate our honour and good faith, we submit the above facts to the consideration of your readers.

I have the honour to be,
On behalf of the Council of the
College of Dentists,
Your obedient servant,
GEORGE WAITE, M.B.C.S.

Old Burlington Street;
June, 1861.

AMERICAN DENTISTS IN EUROPE.

(From 'The Dental Cosmos,' June, 1861.)

THE following remarks on this subject, appearing in an American paper, will, we are sure, be perused with satisfaction by our readers.

It is singular, but not less true, that, because a few American dentists who possessed manipulative skill of an order which would have secured for them a high professional reputation and competency anywhere, either at home or abroad, by a combination of fortuitous circumstances, on going to Europe, struck upon a vein which has enabled them to acquire princely fortunes, and at the same time give a marked *prestige* to American dentistry, it has been inferred that the entire dental profession all through Europe is in a most benighted condition, and that it would be an act of mercy and charity to send dental missionaries from our country on an errand of salvation to these benighted creatures, and shed upon them the bright effulgence of our superior attainments in theory and practice.

Now with all due respect to the opinions, and with no disposition to doubt the veracity, however much we may question the judgment, of those members of our profession who have made flying visits of a month's duration to Europe, called upon half a dozen dentists in that time, and returned home with the most deplorable accounts of the ignorance and incompetency of the dental profession in the Old World, we have invariably received such statements "*cum grano salis*." There was a time, and that at no remote period, when there was great need for reformation, not only in Europe, but also in America, and there is still room for improvement in both. It must not be supposed, however, that the uprising which has been attended by such remarkable results in our own country has found no counterpart in the Old World. On the contrary, everything indicates in the strongest manner possible that a decided and radical revolution has taken place there.

The organization of societies, the establishment of periodicals, the foundation of schools, and the hearty and liberal support that each and all of these receive in England, demonstrate this beyond a question of doubt.

Again, it must be remembered that up to the last twenty-five years we were indebted to the Old World for our literature, as prior to that time little or nothing had been accomplished in that direction by us.

In point of practice but few opportunities are afforded us of examining the operations of European dentists, but we have met with fellow-practitioners, in whose judgment and veracity we have every confidence, who

inclined to think more favorably of "Townsend's cement," though I have no doubt that the addition of a little more silver would tend to make it harder and more durable.

Montreal, C. E.;
June, 1861.

EARLY DEPOSIT OF OSTEO-DENTINE.

By EDWARD N. BAILEY, D.D.S.

(From 'The Dental Cosmos,' June, 1861.)

MISS S—, about seventeen years of age, of a sanguine and highly nervous temperament, called in March to have some teeth filled. They were very badly decayed, with the prospect of several exposed nerves; excavated carefully, and with the aid of chloride of zinc and creosote, prepared and filled the two superior frontals, left lateral and canine, on both approximal surfaces, being surprised at the extent of the caries without involving the nerves. Next opened the superior left first bicuspid anterior approximal surface and crown to the posterior indentation, removed the

discoloured dentine with caution (having previously treated with chloride of zinc and creosote), until I had the base of the cavity exposed clearly to view; perceived near the centre a small opening with a raised white ring around it, and beyond this, dark bone to the walls at the sides. Introduced the point of a fine probe into the opening, expecting to touch the nerve; no sensation of pain; extended it farther up, about one sixteenth of an inch, and it was stopped by firm resistance; removed the dark bone around the white ring, leaving it a tube standing firm and hard in the centre of the base of the cavity. Not finding the nerve exposed, filled it without any attending pain. The opposite right first superior bicuspid still more decayed, and broken down from the posterior approximal surface; removed the discoloured bone and found a similar projection and opening in the centre, but the nerve was exposed at two points corresponding to the cusps. Treated it; and on cutting across from the exposed points and behind the projection into the nerve cavity found it to be very small, without sufficient opening into the roots to pass a fine nerve broach, the carbuncle of osteodentine adhering firmly to the anterior wall of the cavity.

Dental News and Critical Reports.

PLYMOUTH DENTAL DISPENSARY.

It is with pleasure that we give publicity to the following prospectus. Institutions of this kind, if properly worked, cannot fail to advance the cultivation of dental surgery, and the names of the dental officers will in this instance be accepted as a sufficient guarantee that the objects of the charity and the interests of the dental profession will be faithfully observed.

DENTAL DISPENSARY.

Physician—CHARLES HINGSTON, Esq., M.D.

Surgeon—WARREN ISBELL, Esq., F.R.C.S.

Consulting Dentists—CHARLES BATE, Esq.;
STRATTON COLES, Esq., M.O.S.

Dentists—F. A. JEWERS, Esq., M.O.S.; C. F. TUBBS, Esq., M. O. S.; C. SPENCE BATE, Esq., L.D.S.; WM. MOORE, Esq.

The Dental Dispensary, of which the gentlemen whose names appear above constitute the staff, is proposed to be founded, with the intention of supplying a deficiency in the Curative Charities of the neighbourhood.

It is intended to embrace within its limits the treatment of the diseases of the teeth.

The dentists will attend at specified times to stop, regulate, or extract the Teeth; or to adopt such other course as the necessity of the case may suggest.

It is proposed to open a Subscription List to carry out these advantages, by engaging suitable rooms, &c., for which purpose only a small sum is necessary.

Subscriptions may be paid to

ALFRED P. BALKWILL, Sec. *pro tem*.

65, Old Town Street, Plymouth;
July 10th, 1861.

The Month: Miscellaneous and Scientific Intelligence.

THE COLLEGE OF DENTISTS.

THE Council of the so-called "College of Dentists of England" lately requested the insertion in our columns of a statement in reply to the charges—that they had no right to that title, since they represented only a section, and that the less respectable, of the dental profession of England; that they encumbered the progress of the dental profession by assuming to give diplomas in the presence of a well-constituted governmental body specially appointed by charter for that purpose; and that they dishonoured the name of "College" by profusely decorating with the collegiate title men who have persistently degraded the dental profession by touting advertisements of an objectionable kind. To these charges the Council have delivered a very solemn and deliberate reply; they have made, with great affectation of ingenuous candour, statements in defence which it has been our duty to analyze; and if we show that they are wholly and inconceivably without foundation, this institution will cease to be ranked amongst those which can be tolerated or recognised in an honorable profession.

First, we observed that this institution—self-constituted and self-styled "a College"—had no claim to that title; that its constitution was shifting and susceptible of any abuse, regulated only by its own will, and capable of being perverted, by the unscrupulous, to others' own uses; and that it was without a charter. The Council state:—"We are in every particular constituted as many other Colleges—such, for instance, as the College of Preceptors, the Agricultural College, and the College of Civil Engineers." This seems to be a very satisfactory answer; so it would be if there were a grain of truth in it. We are reluctantly compelled, however, to state that the Royal College of Preceptors we find to have been "incorporated by Royal Charter, March, 1849;" the Royal Agricultural College to have been "incorporated by Charter, granted by her Majesty in Council, March 27th, 1845;" the

Institution of Civil Engineers—the College of Civil Engineers has long ceased to exist—to have been incorporated by Royal Charter in 1828. This may be thought to be well-nigh incredible, but such are the facts.

So much for the answer to the first part of the charge. To the second part the Council replied that their rules forbade unprofessional advertising, and that they were careful to exclude dentists who placarded themselves. We have, then, to announce, as the result of an analysis of the recently published list of 135 names, that 30 are associated with touting. We will select some choice specimens.

One member of the College, of the family of Moseley—of whom three are members—elected in 1856, advertises habitually, now, as for years, "Teeth by her Majesty's royal letters patent; newly invented and *patented* application of the terreous artificial teeth, without wires or fastenings." In the course of half a column of fustian he speaks of "Decayed and tender teeth permanently restored to use, preventing the necessity of extraction." Looking to the practice of the member whose name stands next in the list of this College, Mr. Neep, we find that in the 'Norfolk News' of January, 1861, he describes himself as a certificated member of the College of Dentists of England, and "respectfully announces that he continues to supply artificial teeth upon the most scientific principles, which are guaranteed to answer every purpose for mastication, beauty, comfort, and durability not to be surpassed," &c. A third member, Mr. Dagnall, recently informed the "gentry of Hampton," by printed circular, decorated with the royal arms, that he was a M.C.D.E.; that he possessed a "new and important discovery;" and that "persons were waited on at their residences without extra charge." How much further are we to go? Must we quote the puffs of the gentlemen who announce in the 'Weston-super-Mare Gazette' that they "are able to fit plates to the stumps without the amount of irritation usually produced;" and who also "attend persons at their own resi-

dences without a fee"? Shall we mention Mr. Wotton, also a M.D.C.E., who startles the public of Cornwall and Devon by proclaiming, "Teeth protected by royal letters patent;" "the teeth with coral India gums by patent machinery;" and whose "patented coral India gums must be seen to be admired," &c.? None of the above members were admitted by *examination*, but on the ground of their claims by standing and respectability.

We repeat, then, that there are thirty names of persons whom we know to be touting dentists in the list of the members. The above are extracts from a few of their advertisements. The Council say that they have "rules" upon the subject on which they act. Then if these do not contradict their rules, they are even less worthy of professional regard than we have ventured to think. If they do, the conduct of the Council in admitting men known to be guilty of such puffs, in spite of their regulations, is treasonable to those who joined them on the faith of their rules, and must deprive them of any claim to confidence.

Let us dismiss this part of the question. If the Council had conducted otherwise the affairs of this establishment, it would still have been a mischievous superfluity. The College of Surgeons has provided an organization for examining dentists, in response to the repeated appeals of the most eminent dentists of the country. One hundred and thirty-one of the most distinguished members of the dental profession have passed that examination, and amongst them twelve out of the seventeen dentists to metropolitan hospitals, four having declined to join any organization whatever. There is an excellent hospital and school, numbering most of the distinguished names amongst its professors; and we have necessarily the assurance that whatever is done under the Royal Charter granted to the College of Surgeons will be done in accordance with its provisions, and in conformity with the known rules of professional conduct. With the self-constituted College of Dentists there is no security whatever; at any moment it may start into new abuses, and the more rapidly as the respectable members fall away in disgust. We may observe, *par parenthèse*, that in their last printed list we find recorded the names of eleven gentlemen who have practically succeeded by obtaining the dental diploma of the College of Surgeons. The certificate

which has been degraded by being habitually paraded in puffs such as we have quoted is not likely to be the object of a legitimate ambition. As this institution fails in respectability it is likely to grow in desperation, and from its extraordinary constitution we have no security that it may not give further encouragement to touting pretenders.—*Lancet*.

To Correspondents.

NOTICE.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.
2. All communications relative to subscriptions and advertisements are to be addressed to the Publisher, Mr. John Churchill, 11, New Burlington Street, London, W.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. The Journal will be supplied direct from the Office on PREPAYMENT of subscriptions as under:

Twelve Months (post-free)	. . . 13s. 0d.
Six Months	" . . . 6s. 6d.

Post-office Orders to be made payable, at the Regent Street Office, to John Churchill, 11, New Burlington Street, W. A single number sent on receipt of thirteen stamps.

"Inquirer."—Thanks; we shall be glad to hear from you again.

Friend "George" is cordially thanked. The selections from the work lent is excellent.

Communications have been received from Messrs. C. Spence Bate; A. P. Balkwill, Baytown; Hearder; O. A. Fox; Charles James Fox; W. Ford; Friend George; Inquirer; J. H. Kyan; and Robert Buist.

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British Journal of Dental Science.

No. 62.

LONDON, AUGUST, 1861.

VOL. IV.

Dental Surgery and Medicine.

FILLING TEETH.

[Read before the Kentucky State Dental Association, April 9th, 1861.]

BY DR. W. M. ROGERS.

(From 'The Dental Register of the West,'
June, 1861.)

THE filling of decayed teeth is a department of professional duty, in which a greater number of individual operations are performed than in any other, and as each of these efforts involves, in a very great degree, the comfort and happiness of the patient, as well as the character and reputation of the operator, we may safely conclude that anything which may throw light upon this subject will be of interest to those to whose peculiar office the treatment of these organs appertains.

I would not presume to enter into a general detail of my own manner of filling teeth. I only propose to notice in something of regular order a few things which I conceive to be of importance, gathering in only such corollary details as may sustain an intimate relation to the ultimate success of the operation, and guarding some of the sources which my observation teaches me to believe are causes of failure.

The confidence of the patient is, of course, presumed to be extended to the operator; without this, it were better that nothing should be attempted.

After an examination of the denture, and the decision upon the indications there presented, it is my practice to commence operations, all things being equal, upon the molars in preference to the remaining teeth, and then upon the bicuspid, taking the cuspidati and incisors last under treatment. This course is better calculated to secure

the attendance of the patient, until the whole denture has received attention, as few persons once aroused to the necessity of submitting to the hands of the dentist, will desist at any stage short of the security of the front teeth.

With inexperienced or very timid patients, it may be proper to commence upon the simpler and less painful cavities, progressing to those involving more complication, and of a higher degree of sensitiveness, thus familiarizing the subject for the "tug of war."

Prior to the preparation of a cavity for filling, it becomes necessary to secure such an approach as will permit the proper manipulations, with instruments adapted to the purpose of excavating the decay, and of introducing, consolidating, and finishing the filling.

If the defect is upon the approximal surface of the tooth, one of the ordinary methods of separation is resorted to, as circumstances may seem to demand.

For separations made by cutting away the surface of the tooth, I prefer the chisel, or rather I should say, the hatchet, applied somewhat after the manner of the chisel. This instrument has a blade about one half an inch long, the edge of which is about three eighths of an inch broad, its plane extending on a line with the shaft, at an angle of about sixty degrees therefrom.

I have preferred this to the chisel, for the reason that in manipulating with it the thumb of the hand in which it is held may, in most cases, rest upon an adjoining tooth, guiding the course of the blade, and giving security from accidents.

It may be used upon the lingual margins of the anterior teeth with great facility.

For the separation of the posterior molars, a similar instrument, but having the line of the blade transverse to the shaft, may be used with facility.

A separation once being resolved upon, every consideration urges the importance of making it wide enough to secure the end contemplated, in the most complete manner. *Space* in which to manipulate *properly* is an absolute requisite. The character of each separation must be determined by the conditions of the individual case.

For separations by mechanical pressure, I prefer to use caoutchouc; intervening it between the affected teeth. A separation to any extent once being secured by this means, should the teeth become irritable and painful, it is well to desist for the time, yet being careful to retain the space already made by the substitution of a piece of cork, or other less elastic substance, in place of the gum. When the unfavorable symptoms subside, the treatment with the gum may be resumed. With this precaution, cases may be urged to a successful result, that the operator might otherwise be tempted to give up in despair.

In the preparation of the cavity of decay, the manipulations must, of course, vary with the almost endless variety of conditions presented for treatment.

I have, after careful observation, become satisfied that, as a general principle, it is better to have a cavity when finished something larger within than at the orifice. Although such an excavation may induce a necessity for precautions in filling, not applying to one having parallel walls, yet when the work is once done, and properly done, I think there will be greater security in the filling.

For the purpose of embodying as far as possible in a small space that which might otherwise require a very prolix explanation, I propose to take a condition of decay often found upon the upper molars, and proceed to the manner of its treatment.

We will suppose the tooth to have a central crown cavity, with lines of decay radiating along the approach of the enamel as it ascends to the depressions between the cusps. The line extending to the posterior terminates in a fissure affected by decay, and passing from the buccal angle across the coronal surface, over the lingual angle, and thence upon the lingual surface, terminating in an enlargement about its centre.

In preparing this for filling, I would

first break away the margin of enamel over the central cavity, giving symmetry to the periphery by the use of the burr drill. Then enter a suitable drill upon the extremity of one of the radiating lines, and drill thence in the direction of the line until the decay is eradicated, or otherwise enter the drill at any number of points upon the affected line to a proper depth; then with a suitable instrument cut away the intervening parts, making the elongated cavity continuous throughout all its margins.

It may be found that one or more of the radiating extensions are broader at their emanation from the central cavity, and converge to a point at the extremity; in such case, I would enter the drill at the point, and then cut away the parts intervening between this and the centre with broad bladed excavators. The same principles of procedure may be applied in the preparation of the transverse fissure. That part of this latter cavity which forms the connection by its extension over the angle, with the defect upon the lingual surface, often proves a source of great annoyance in its preparation. There is danger that an excavator or drill applied here with effective force may slip and wound the mouth.

Here a separating file, secured in a suitable carrier, may be used to great advantage, by filling up through the fissure, being careful at the same time to keep the plane of the file on a line continuous both with the coronal and lingual decay.

It is advisable to pare away the sharp edge of the margins of the cavity throughout its whole extent. This is a matter of greater importance in friable teeth, for the reason that a very delicate point may be abraded by the pressure necessary to the consolidation of the filling, when an obtunded margin will not be thus injured. Such imperfection will, of course, invite a recurrence of decay.

In preparing the gold for filling, I would proceed as follows: Cut the sheet into strips of one third to three fourths of an inch in width, and fold these longitudinally. When folded, the width of the slip should be a little greater than the depth of the cavity for which it is designed. This is then rolled into cylinders upon the point of a small broach, making one or several of these from each slip as may be desirable.

Then prepare a few pieces by folding them flat upon a watch spring; the length and breadth of these flat pellets should correspond to the purposes to which they

are to be appropriated, as hereafter described.

In addition to this, have at hand some of these slips folded as at first directed, and cut into two or three pieces.

The gold should be handled with great care, using the forceps in lifting it, and in every way avoiding as much as possible its contact with the fingers. When ready for the filling, it should be soft, neat, and smooth. With everything thus prepared, the cavity having been syringed and dried, and the encroachments of the saliva being guarded against, it will be proper to commence the operation of filling by introducing one of the larger cylinders into the central cavity, handling it very softly with the forceps, and thrusting it fully to the apex of the cavity, yet permitting the lower end to protrude. This should then be pressed rather gently to one of the walls, when another cylinder should, like the first, be placed carefully in position with as little disturbance of its shape as possible—this is also forced with gentle pressure to the walls. Thus cylinder after cylinder is introduced, until the outer wall is lined at all points with the gold, which will now remain "in situ," while attention is given to other parts of the operation.

With the forceps now introduce one of the flat pellets before prepared into either of the radiating lines, having it to extend the whole length of the excavation, from the extremity to the central filling. If the cavity will permit, this may be placed to one side with slight compression, and another introduced by its side, when a flat pointed instrument should be entered between the two, and the space thus produced filled with the slips prepared for that purpose; then again introduce the flat point and fill as before, repeating this to the complete consolidation of the gold. If the cavity will only admit one pellet, this may be of sufficient width to permit its central part to be forced up along the whole line of its extent, and immediately consolidated—or if advisable, steps may be used in its open centre, and afterwards be compacted by direct pressure.

The same process is applicable to all the radiating cavities, as also in many cases, to the posterior transverse continuation.

After filling the radiating lines, it will be necessary to recur to the unfinished central portion. Into this introduce a small, round-pointed instrument; when withdrawn, follow by a larger, and again by a yet larger and larger one, until the

gold is as thoroughly compacted as the integrity of the tooth will permit. We have then a cavity within the filling. This should be filled as if a simple excavation, until a sharp plugger cannot be entered by any ordinary effort.

It frequently occurs that there is an enlargement at the juncture of the posterior radiation with the transverse cavity. In such case, after introducing the flat pellets into the transverse cavity, cylinders may be used to fill this enlargement, a procedure which adds to the strength of the filling, as this point usually rises higher into the dentine, and consequently gives better surface for attachment. The same remarks apply to the enlargement at the lingual extremity of the continuation of this cavity.

The pellets placed in the coronal transverse cavity should protrude full out at the angle of the tooth, and those in the lingual extension should reach the whole remaining length of that cavity; or better yet, the pellets may be placed in the coronal and lingual parts alternately, intersecting each other at the angle. If neither of these processes is practicable, then, after filling the two extremities, without reference to each other, again introduce the file as before directed in excavating, cutting up into the gold, until the file reaches the line to which it was at first carried. This results in a simple incision, one end of which is upon the coronal, and the other upon the lingual surface. This may be filled by pellets, extending throughout its length, and then by strips, as before directed for other parts of the filling.

I think these elongated pellets of importance, because the gold is less liable to abrade at the angle of the tooth, or to be dislodged by any accidental violence, than by any other mode, having less of attachment throughout the extent of the cavity.

The gold being introduced and consolidated, it now remains to finish the filling, by filing away all superfluity even with the margins; when the work may be polished by the use of stones, powders, &c., as the operator may prefer.

This cavity being disposed of, I propose to consider a condition often presented upon the bicuspid, although not by any means peculiar to them.

It is that of an approximal decay complicated with a supervening defect of the coronal surface. In this case, the file or chisel may be used very sparingly by cutting away the coronal surface of enamel

which lies over the approximal decay, thus throwing both cavities into one. This excavation when finished, should be larger within than at the approximal opening. The cervical wall should also be a little deeper within than at the margin, but if deeper, it is well to emphasize it, only a little deeper.

In introducing the gold, place as large a cylinder as can be used without marring its integrity as soft gold, in the cavity, the end protruding out from the approximal orifice, and with a flat-bladed plugger press it gently to one of the side walls; apply another cylinder in the same manner to the opposite wall, then introduce a third between these—this should be large enough to fill the intervening space from side to side, and yet not so large as to drag the first two from their positions as it is carried to its place against the cervical wall. This being in place, with a square or oblong pointed plugger, of a size at the point that just permits it to pass between the side cylinders, press the intervening gold with sufficient force to the cervical wall to consolidate it—this, when properly done, will secure the side cylinders in place. If these last have been chosen of sufficient size to protrude from the cavity at the coronal opening after the lateral pressure has been applied, it will only remain to introduce another and another cylinder between these, until the cavity is full, successively consolidating each one thus placed before another is introduced. Or otherwise the space between the side cylinders, remaining after the first consolidation of intervening gold, may be treated as a primary cavity, using of course in this smaller space cylinders adapted to the case—such as those first used would here be too large. But if the side gold does not protrude from the coronal opening, then all the gold first introduced should be consolidated as a simple filling,—after, perhaps, the prior introduction of one or two cylinders in the centre, according as the depth of the cavity may require or the length of the side gold will permit. The remaining coronal extremity may be filled by the same process.

A case similar to this is described in the 'Dental Cosmos' for January, 1860, by Dr. Charles Woodnutt, the object of which is to avoid the use of the file in the treatment of approximal cavities, by cutting down the coronal surface into the cavity. In either event, I would prefer to separate to some extent, as there generally exists some superficial imperfection, which should

be removed, and the approximal margins of the filling are all the safer for optical examination. The grand object, however, to which I have desired to invite attention is rather to the *filling* of the tooth.

Another case will complete the individual cavities of which I design to speak. We will now take a central incisor decayed upon one of its approximal surfaces, having a considerable part of its lingual wall broken away, leaving a very narrow point upon which to operate near the delicate cutting edge of the tooth—this will not afford a wall as a reliable antagonist to the cervical margin. With such a condition of decay, I would proceed to cut as deep into the tooth as the safety of the nerve will permit, excavating forward to the labial and backward toward the lingual surfaces at the same time, inclining the cervical wall upward as it penetrates into the tooth.

This cervical part of the cavity will then be enlarged within the walls, meeting each other rather angularly. Now secure at the point of the tooth as good a wall as the conditions will admit. This done, the cavity will present a V-shaped orifice, the base lying upon the cervical wall, and the apex extending toward the cutting edge of the tooth. The margins of the orifice upon the lingual line yet remain, of course, imperfect.

In introducing the gold, place a large soft cylinder so as to occupy a position both against the cervical and the lingual walls; this, when pressed into the angle formed by the approach of these walls, should protrude below the broken lingual margin, reaching thence to the opposite side of the fracture; the end of the cylinder should likewise appear full out from the approximal orifice. The plane of the inner surface of the flattened gold should be about parallel with the labial wall. The gold being in this condition, introduce as large a cylinder as may be used between the gold in the tooth and the opposing surface; press this up against the cervical wall, and consolidate well. It may be expedient to place two or more smaller, instead of this larger cylinder last mentioned; if so, arrange them regularly side by side in the cavity, and then consolidate. This will secure the gold at that point with firmness. In the same manner place other cylinders, arranging them carefully, and consolidating well as the work progresses.

When the point is reached at which the consolidation of gold in the direction of the axis of the tooth must cease for want of a

lingual wall to resist the filling on that side, it will become necessary to resort to the imperfect excavation at the cutting edge, for additional security to the remainder of the filling.

When brought to this stage, the secondary cavity now remaining will appear about as follows:—We have, first, the labial plate entire; a small part only of the lingual wall, the fractured part being to some extent supplied by the extension of the first cylinder introduced. Again, we have the excavation at the point, and opposite to this the wall of consolidated gold, the face of which should incline a little forward to the labial plate of enamel and ascend a little upward as it extends into the tooth. This cavity may now be filled with slips or cylinders, applying the pressure of the final consolidation outwardly and obliquely in the direction of the excavation. This last case is one of those in which crystal gold would seem to be especially applicable.

One of the main principles which I have attempted to illustrate in the preceding cases is that of giving strength to the weaker points of a filling, by continuing the gold there applied from such portions of the cavity as will secure the firmest attachment which the case may permit.

A very important requisite to the perfection of a filling is good foil. Every case does not of necessity require a material possessing the same uniform qualities. Gold capable of being worked into a very excellent coronal filling may be totally unfitted for the same result in an approximal cavity of difficult access.

The properties of foil to which these different results are referable are its degree of softness and of adhesiveness. Purity and toughness are absolute pre-requisites in any case. The softer the gold when first introduced, the better may it be adapted to the minute irregularities of the cavity. It avails little that the gold be soft when it comes into the hands of the dentist, if in the manipulations preparatory to its application to the purposes of a filling, it be frequently and rudely handled.

The advantages of foil over gold in mass, for the purposes of a filling, lie in the fact that the laminæ of foil may be made to lie loosely upon each other, and yet be brought into a condition of comparative solidity by the application of pressure, under which application they may slide upon each other, thus admitting adaptation to minor irregularities among their own surfaces, as well

as to those of the cavity in which the gold is placed.

If this statement is true as a primary fact, then the superiority of thin to thick foil for general purposes in dentistry follows as a consequence; and hence also, a given weight of No. 4 foil, prepared for a filling, being loose in its structure, is susceptible of a greater comparative compressibility than the same weight of No. 20, prepared in like manner—a difference of great importance, as that which yields most kindly to the impress of the instrument, upon the one hand, takes shape to the opposing cavity with like readiness upon the other.

In proportion as foil is possessed of the property of adhesiveness, so will it approximate to the stubbornness of massive gold, as its laminæ are brought in contact under pressure. This property renders it necessary that the application of pressure should be made with the greater caution at the right time, in the right direction, and of the proper degree, for the security of the immediate purpose.

The softer and more friable the structure of the tooth, the greater is the necessity for the softer gold, for with this there is less danger of abrading the margins of a cavity, if a *sufficient* pressure *only* has been used to secure proper consolidation. It will not be presuming too much to say, that very many otherwise good fillings are ruined for their purposes, by inattention to this point. The abrasion of a margin may not at first appear, but time will certainly develop the imperfection.

In the course of this paper, I have indicated a preference for the slight enlargement of the interior of cavities in preparation for filling. This preference is founded upon an idea that in addition to the many causes which conspire to the destruction of fillings in the teeth, there is one not generally noted, to which I ascribe importance.

With some hesitation I assert it that the difference in the expansibility of dentine and enamel from that of gold, under the varying degrees of caloric to which they are subject in the mouth, considered in connection with the peculiar condition in which most of our operations in filling teeth are discharged from our hands, has a *tendency*, by philosophical necessity, to expel the filling from the cavity during a long process of the operation of these causes. An object held on a strain between two points tends to slide from the grasp of the weaker point to that of the stronger.

I think it would be found to be a fact

upon investigation, that by far the larger number of our fillings are more thoroughly consolidated at the surface than in the interior, and that as we ascend deeper into a filling, the less of density we find.

Without being committed to the confession that there is any necessity that such should be the case, it is only pertinent to the present purpose to assert that the fact so exists.

In the thousands of times in which the temperature of the teeth and the fillings in them is altered in the mouth, the gold in all such cases as these just mentioned, in undergoing contraction, goes from the point of less adhesion—from the direction of the interior—to that of greater consolidation, and consequently of greater security, in the direction of the surface. It is true that if we suppose, for the moment, that the gold is undergoing expansion from an elevation of temperature, then it may be elongated in the direction of the lesser resistance and toward the interior of the tooth; yet the resisting surfaces to inward extension are co-extensive with the walls of the cavity, and are always in operation, while any very minute length of the filling, once protruded from the orifice, ceases for ever to take part in the action, except it may be made potent in resisting any inward retraction, by virtue of a very slight enlargement on being relieved from the grasp of the orifice. In forming the cavity larger within than at

the orifice, I would purpose to remedy this supposed evil. More or less inequality exists in the interior of almost every cavity—a happy fortuity if what I have said is correct. It will at once be perceived that these intero-enlarged cavities will require especial attention, to the proper consolidation of the interior part of the filling.

Another remark upon the manner of placing gold in a cavity, and I am done. All that has been said is upon the presumption that the gold is introduced in such manner that the laminæ shall extend from the bottom of the cavity outwardly to the margin. These should extend *directly* out and on as nearly parallel lines as possible, and should have as much lateral consolidation as can be safely given prior to any attempt to consolidate in the direction of the axis of the filling, otherwise the gold when polished down will present upon its surface many points at which the ends have been pressed below the disc, and these, being severed from their actual connection with the laminæ, will in time lose their attachments, thus spoiling the beauty of the filling. In proportion, however, as the gold is adhesive, will this result be lessened.

Having marked out a specific course to follow, which will in itself consume too much, perhaps, of the time of the association, I have not spoken of many points of interest to myself, and must claim credit for at least this exhibition of discretion.

Mechanical Dentistry.

ON HARDENING AND TEMPERING STEEL.

(Continued from page 176.)

SECTION II.—*Practice of hardening and tempering Steel.*

It may perhaps be truly said, that upon no one subject connected with mechanical art does there exist such a contrariety of opinion, not unmixed with prejudice, as upon that of hardening and tempering steel; which makes it often difficult to reconcile the practices followed by different individuals in order to arrive at exactly similar ends. The real difficulty of the subject occurs in part from the mysteriousness of the change; and from the absence of de-

fined measures, by which either the steps of the process itself, or the value of the results when obtained, may be satisfactorily measured; as each is determined almost alone by the unassisted senses of sight and touch, instead of by those physical means by which numerous other matters may be strictly tested and measured, nearly without reference to the judgment of the individual, which in its very nature is less to be relied upon.

The excellence of cutting tools, for instance, is pronounced upon their relative degrees of endurance, but many accidental circumstances here interfere to vitiate the strict comparison: and in respect to the measure of simple hardness, nearly the only test is the resistance the objects offer to the

file, a mode in two ways defective, as the files differ amongst themselves in hardness; and they only serve to indicate in an imperfect manner to the touch of the individual, a general notion without any distinct measure, so that when the opinion of half a dozen persons may be taken, upon as many pieces of steel differing but slightly in hardness, the want of uniformity in their decisions will show the vague nature of the proof.

Under these circumstances, instead of recommending any particular methods, I have determined to advance a variety of practical examples derived from various sources, which will serve in most cases to confirm, but in some to confute, one another; leaving to every individual to follow those examples which may be the most nearly parallel with his own wants. There are however some few points upon which it may be said that all are agreed, namely—

The temperature suitable to forging and hardening steel differs in some degree with its quality and its mode of manufacture; the heat that is required diminishes with the increase of carbon:

In every case *the lowest available temperature* should be employed in each process, the hammering should be applied in *the most equal manner throughout*, and for cutting tools it should be continued until they are nearly cold:

Coke or charcoal is much better as a fuel than fresh coal, the sulphur of which is highly injurious:

The scale should be removed from the face of the work, to expose it the more uniformly to the effect of the cooling medium:

Hardening a second time without the intervention of hammering is attended with increased risk; and the less frequently steel passes through the fire the better.

In hardening and tempering steel there are three things to be considered; namely, the means of heating the objects to redness, the means of cooling the same, and the means of applying the heat for tempering or letting them down. I will speak of these separately, before giving examples of their application.

The smallest works are heated with the flame of the blowpipe, and are occasionally supported upon charcoal; but as the blowpipe is used to a far greater extent in soldering, its management will be described in the chapter devoted to that process.

For objects that are too large to be

heated by the blow-pipe, and too small to be conveniently warmed in the naked fire, various protective means are employed. Thus an iron tube or sheet-iron box inserted in the midst of the ignited fuel is a safe and cleanly way; it resembles the muffle employed in chemical works. The work is then managed with long forceps made of steel or iron wire, bent in the form of the letter U, and flattened or hollowed at the ends. A crucible or an iron pot, about four to six inches deep, filled with lead and heated to redness, is likewise excellent, but more particularly for long and thin tools, such as gravers for artists, and other slight instruments; several of these may be inserted at once, although towards the last they should be moved about to equalise the heat; the weight of the lead makes it desirable to use a bridle or trevet for the support of the crucible. Some workmen place on the fire a pan of charcoal dust, and heat it to redness.

Great numbers of tools, both of medium and large size, are heated in the ordinary forge fire, which should consist of cinders rather than fresh coals; coke and also charcoal are used, but far less generally; recourse is also had to hollow fires, the construction of which has been previously explained; but the bellows should be very sparingly used, except in blowing up the fire before the introduction of the work, *which should be allowed ample time to get hot*, or as it is called, to "*soak*."*

Which method soever may be resorted to for heating the work, the greatest care should be given to communicate to all the parts requiring to be hardened a *uniform* temperature, and which is only to be arrived at by cautiously moving the work to and fro to expose all parts alike to the fire; the difficulty of accomplishing this of course increases with long objects, for which fires of proportionate length are required.

It is far better to err on the side of deficiency than of excess of heat; the point is rather critical, and not alike in all varieties of steel. Until the quality of the steel

* It is a common and excellent practice amongst the Sheffield workmen to use coke both in forging and hardening steel goods. They frequently prepare it for themselves, either upon the forge hearth or in a heap in the open yard. In that celebrated town a decided preference is given, for the purpose of hardening, to the light coke of the Deepcar coal, which is obtained about eight miles N.W. of Sheffield, although, for ordinary use and for forging, this is considered an inferior kind of coal, and of light quality; other workmen prefer charcoal for hardening.

is familiarly known, it is a safe precaution to commence rather too low than otherwise, as then the extent of the mischief will be the necessity for a repetition of the process at a higher degree of heat; but the steel, if burned or overheated, will be covered with scales, and what is far worse, its quality will be permanently injured; a good hammering will, in a degree, restore it; but this in finished works is generally impracticable.*

Less than a certain heat fails to produce hardness, and in the opinion of some workmen has quite the opposite effect, and they consequently resort to it as the means of rapid annealing, not, however, by plunging the steel into the water and allowing it to remain until cold, but dipping it quickly, holding it in the steam for a few moments, dipping it again, and so on, reducing it to the cold state in a hasty but intermittent manner.

There is another opinion prevalent amongst workmen, that steel which is "*pinny*," or as if composed of a bundle of hard wires, is rendered uniform in its

* It is argued by some, that by heating pieces of steel to different degrees, before plunging them into the water, the one piece attains full hardness, the next the temper of a tool fit for metal, another of a tool fit for wood, a fourth that of a spring, and so on. That this view is not altogether without foundation, appears in the fact that if the end of a piece of steel be made entirely hard, the transition is not quite immediate from the hard to the soft part; and Mr. Ross, in making the dividing-points, for his dividing-engine, hardens the end of a longer piece of steel than is required, and forms the point upon the grindstone, exactly at the part where the temper suits, without the steel being let down at all; a practice first employed by Mr. Stancliffe, a workman formerly employed by the celebrated Ramsden. In hardening by this method, however, without tempering, the scale of proper hardness is confined within such extremely narrow limits, as to be nearly useless; thus, it frequently happens that in a number of tools heated as nearly alike as the workman could judge, some few will be found too soft for any use, although they were all intended to receive the ordinary hardness, so as to require letting down, as usual with those tools exposed to violent strains or blows, such as screw-taps, cold chisels and hatchets, although many tools for metal, used with quiet and uniform pressure, are left of the full hardness for greater durability.

With the *excess* of heat, beyond the *lowest that will suffice*, the brittleness rather than the useful hardness of tools is increased; and when *no excess* of heat is employed beyond that *absolutely requisite* for hardening in the usual manner, the steel does not appear to be injured, and the colours on its brightened surface that occur in tempering are an excellent and, in general, sufficiently trustworthy index of the inferior degrees of hardness proper for various uses.

substance if it is first hardened and then annealed.

Secondly, the choice of the cooling medium has reference mainly to the relative powers of conducting heat they severally possess: the following have been at different times resorted to with various degrees of success: currents of cold air; immersion in water in various states, in oil or wax, and in freezing mixtures; mercury and flat metallic surfaces have also been used. Mr. Stodart recommended, as the result of his experiments, plain water at a temperature of 40° Fahrenheit. On the whole, however, there appears to be an opinion that mercury gives the greatest degree of hardness; then cold salt and water, or water mixed with various "astringent and acidifying matters;" plain water follows; and lastly, oily mixtures.*

A so-called natural spring is made by a vessel with a true and a false bottom, the latter perforated with small holes; it is filled with water, and a copious supply is admitted beneath the partition; it ascends through the holes, and pursues the same current as the heated portions, which also escape at the top. This was invented by the late John Oldham, Esq., Engineer to

* I find but one person who has commonly used the mercury; many presume upon the good conducting power of the metal, and the nonformation of steam, which causes a separation betwixt the steel and water when the latter is employed as the cooling medium. I have failed to learn the *reason* of the advantage of salt and water, unless the fluid have, as well as a greater density, a superior conducting power. The file-makers medicate the water in other ways, but this is one of the questionable mysteries which is never divulged; although it is supposed that a small quantity of white arsenic is generally added to water saturated with salt. One thing, however, may be noticed, that articles hardened in salt and water are apt to rust, unless they are laid for a time in lime-water or some neutralising agent.

With plain water an opinion very largely exists in favour of that which has been used over and over again even for years, provided it is not greasy; and when the steel is very harsh, the chill is taken off plain water to lessen the risk of cracking it; oily mixtures impart to *thin* articles, such as springs, a sufficient and milder degree of harshness, with less danger of cracking, than from water; and in some cases a medium course is pursued by covering the water with a thick film of oil, which is said to be adopted occasionally with scythes, reaping-hooks, and thin edge-tools.

Having experimented upon all these means, I am induced fully to acquiesce in Mr. Stodart's recommendation of plain cold water for general purposes; except in the case of thin elastic works, for which oil, or oily compositions, are certainly more proper.

the Bank of England, and was used by him in hardening the rollers for transferring the impressions to the steel plates for bank notes.

Sometimes when neighbouring parts of works are required to be respectively hard and soft, metal tubes or collars are fitted tight upon the work, to protect the parts to be kept soft from the direct action of the water, at any rate for so long a period as they retain the temperature suitable to hardening.

The process of hardening is generally one of anxiety, as the sudden transition from heat to cold often causes the works to become greatly distorted if not cracked. The last accident is much the most likely to occur with thick massive pieces, which are as it were hardened in layers, as although the external crust or shell may be perfectly hard, there is almost a certainty that towards the centre the parts are gradually less hard; and when broken, the inner portions will sometimes admit of being readily filed.

When in the fire the steel becomes altogether expanded, and in the water its outer crust is suddenly arrested, but with a tendency to contract from the loss of heat, which cannot so rapidly occur at the central part; it may be therefore presumed that the inner bulk continues to contract after the outer crust is fixed, and which tends to tear the two asunder, the more especially if there be any defective part in the steel itself. An external flake of greater or less extent not unfrequently shells off in hardening; and it often happens that works remain unbroken for hours after removal from the water, but eventually give way and crack with a loud report, from the rigid unequal tension produced by the violence of the process of hardening.

The contiguity of thick and thin parts is also highly dangerous, as they can neither receive nor yield up heat, in the same times; the mischief is sometimes lessened by binding pieces of metal around the thin parts with wire, to save them from the action of the cooling medium. Sharp angular notches are also fertile sources of mischief, and where practicable they should be rejected in favour of curved lines.

As regards both cracks and distortions, it may perhaps be generally said, that their avoidance depends principally upon *manipulation, or the successful management of every step*: first the original manufacture of the steel, its being forged and wrought, so that it may be equally condensed on all

sides with the hammer, otherwise when the cohesion of the mass is lessened from its becoming red-hot, it recovers in part from any unequal state of density in which it may have been placed.

Whilst red-hot, it is also in its weakest condition; it is therefore prone to injury either from incautious handling with the tongs, or from meeting the sudden cooling action irregularly, and therefore it is generally best to plunge works vertically, as all parts are then exposed to equal circumstances, and less disturbance is risked than when the objects are immersed obliquely or sideways into the water; although for swords, and objects of similar form, it is found the best to dip them exactly as in making a vertical downward cut with a sabre, which for this weapon is its strongest direction.

Occasionally objects are clamped between stubborn pieces of metal, as soft iron or copper, during their passage through the fire and water. Such plans can be seldom adopted and are rarely followed, the success of the process being mostly allowed to depend exclusively upon good general management.*

In all cases the thick unequal scale left from the forge should be ground off before hardening, in order to expose a clean metallic surface, otherwise the cooling medium cannot produce its due and equal effect throughout the instrument. The edges also should be left thick, that they may not be burned in the fire; thus it will frequently happen that the extreme end or edge of a tool is inferior in quality to the part within, and that the instrument is much better after it has been a few times ground; in urging this point, I cannot do better than quote the couplet inserted in Moxon's 'Mechanic Exercises,' and which he describes as having been very old and familiar to smiths even in his day—

"He that will a good Edge win,
Must Forge thick and Grind thin."

* Mr. Jordan informs me that in making the magnets for Fox's dipping needles, which are about ten inches long, one fourth of an inch wide, and the two hundredth part of an inch thick, this precaution entirely failed; and the needles assumed all sorts of distortions when released from between the stiff bars within which they were hardened. The plan was eventually abandoned, and the magnets were heated in the ordinary way within an iron tube, and were set straight with the hammer after being let down to a deep orange or brown colour. Steel, however, is in the best condition for the formation of good permanent magnets when perfectly hard.

Thirdly, the heat for tempering or letting down. Between the extreme conditions of hard and soft steel there are many intermediate grades, the common index for which is the oxidation of the brightened surface, and it is quite sufficient for practice. These tints, and their respective approximate temperatures, were tabulated by Mr. Stodart.

	Degrees.	
1. Very pale straw yellow	430	Tools for metal.
2. A shade of darker yellow	450	
3. Darker straw yellow	470	Tools for wood and screw taps, &c.
4. Still darker straw yellow	490	
5. A brown yellow	500	Hatchets, chipping chisels, and other percussive tools, saws, &c.
6. A yellow, tinged slightly with purple	520	
7. Light purple	530	Springs.
8. Dark purple	550	
9. Dark blue	570	Too soft for the above purposes.
10. Paler blue	590	
11. Still paler blue	610	
12. Still paler blue, with a tinge of green	630	

The first tint arrives at about 430° F., but it is only seen by comparison with a piece of steel not heated: the tempering colours differs slightly with the various qualities of steel.*

The heat for tempering being moderate, it is often supplied by the part of the tool not requiring to be hardened, and which is not therefore cooled in the water. The workman first hastily tries with a file whether the work is hard; he then partially brightens it at a few parts with a piece of grindstone or an emery stick, that he may be enabled to watch for the required colour; which attained, the work is usually cooled in any convenient manner, lest the body of the tool should continue to supply heat. But when, on the contrary, the colour does not otherwise appear, partial recurrence is had to the mode in which the work was heated, as the flame of the candle, or the surface of the clear fire applied, if possible, a little below the part where the colour is to be observed, that it may not be soiled by the smoke.

A very convenient and general manner of tempering small objects, is to heat to redness a few inches of the end of a flat bar of iron about two feet long; it is laid across the anvil, or fixed by its cold extremity in the vice; and the work is placed on that part

* The knife edges, for Captain Kater's experimental pendulum, were very carefully hardened and tempered in a bath heated to 430 degrees; being then found too soft, they were rehardened, and tempered, at only the heat of boiling water, after which they were considered admirably suited to their purpose.

of its surface which is found by trial to be of the suitable temperature, by gradually sliding the work towards the heated extremity. In this manner many tools may be tempered at once, those at the hot part being pushed off into a vessel of water or oil, as they severally show the required colour, but it requires dexterity and quickness in thus managing many pieces.

Vessels containing oil or fusible alloys carefully heated to the required temperatures have also been used, and I shall have to describe a method called "*blowing off*," resorted to for many articles, such as springs and saws, by heating them over the naked fire until the oil, wax, or composition in which they have been hardened ignites; this can only occur when they respectively reach their boiling temperatures and are evaporated in the gaseous form.

The period of letting down the works is also commonly chosen for correcting, by means of the hammer, those distortions which so commonly occur in hardening; this is done upon the anvil, either with the thin pane of an ordinary hammer, or else with a *hack-hammer*, a tool terminating at each end in an obtuse chisel edge which requires continual repair on the grindstone.

The blows are given on the hollow side of the work, and at right angles to the length of the curve; they elongate the concave side, and gradually restore it to a plane surface, when the blows are distributed consistently with the positions of the erroneous parts. The hack-hammer unavoidably injures the surface of the work, but the blows should not be violent, as they are then also more prone to break the work, the liability to which is materially lessened when it is kept at or near the tempering heat, and the edge of the hack-hammer is slightly rounded.

(To be continued.)

DENTAL PATENTS.

BY GEORGE OWEN.

I WRITE in order that it may at any time be seen, by reference to the pages of this journal, what "improvements" in dental practice have been thought by their inventors to be worthy of letters patent; and also what contrivances so patented are, through lapse of time or other causes, open

to the unrestricted use of the profession, or, on the other hand, remain still secured to the patentee.

It would be natural to suppose that no one would incur the expense, the trouble, and the annoyances to which a patentee is exposed, were he not persuaded that his contrivance was possessed of peculiar merit; and it might accordingly be concluded that the records of the Patent Office would be found to furnish nothing but the choicest and most valuable information as to what has been done, or is doing, in any department of science or of art.

This is not the case, however. Many similar so-called "improvements" are patented by different individuals, and some of no value whatever are patented with no other apparent object than to enable the patentee to appear before the public as a person of peculiar skill.—The granting of letters patent by the government is no guarantee whatever that the thing patented is of the least value, or that it may not have been in use years before, or that, if of value, it has not been already patented a dozen times; all that it shows as to these particulars is, that the inventor thought it worth his while, *for some reason or other*, to obtain a patent. The responsibility as to the value of the invention, or the validity of the patent, rests entirely with the patentee.

The present patent laws came into operation in October, 1852, and appear to have induced an enormous increase in the demand for patents. As regards dental patents, the following table shows that the first was granted in 1744, and that during the 105 years next following, seventeen such were granted; whereas in the eight years following the introduction of the new laws, *i. e.* to September, 1860, the number has been 56; as may also be seen by the following Table.

I propose to furnish a record of every patent relating to dental matters that has been granted in this country to the present time, confining myself to the order of their dates, giving also the dates of their expiration, adding any remarks I may have to make.

In describing the inventions, I shall confine myself as much as possible to the words of the specifications, either quoting them entire, or making only necessary extracts, but this plan cannot be in all cases followed.

Table showing the number of Dental Patents granted in each year, from the date of the first, in 1744, to September, 1860.

1744.....1	1839.....1	1854.....6
1773.....1	1845.....1	1855.....11
1778.....1	1846.....2	1856.....2
1791.....2	1848.....2	1857.....7
1799.....1	1849.....1	1858.....4
1800.....1	1850.....1	1859.....14
1825.....1	1852.....3	1860.....7
1837.....1	1853.....2	

1744. Thomas Greenhough.—For a tincture for cleansing and preserving the teeth, and curing toothache. Expired in 1758.

1773. Jacob Hemet.—For "an essence of pearl, and pearl dentifrice," so called.

1778. Francis Gillanders.—For a method of covering artificial and also decayed natural teeth and gums with a composition or substance that will admit of being coloured so as to imitate the natural teeth and gums, and that will not corrode, stain, or lose its colour in the mouth.

EXTRACT FROM THE SPECIFICATION.

"This is effected, either by coating artificial teeth, made of gold or any other metallic substance or composition that may be found fit for the purpose, with enamel, or by covering such artificial teeth as are made of ivory or any other kind of bone, or such parts of them only as are exposed to view, with gold or such other metallic substance or composition as may be found fit for the purpose, enamelled and coloured with enamel colours vitrified so as to match or imitate the natural teeth or teeth and gums with which they are to appear; and such gold or metallic substance thus fitted and enamelled are fixed to the artificial teeth by studs, pivots, or screws soldered thereto before they are enamelled, or by means of such cements, glues, or other substances as may be found most effectually to connect such enamelled fronts or casings to the artificial teeth."

No formula is given for the enamel.
Expired 1793.

1791. Richard Stringer.—For a chemical preparation, called Stringer's Essence of Myrrh, for curing scurvy in the gums, &c., &c., &c.

SPECIFICATION.

"Take—Gum myrrh, grains ten;
Spirits of wine, half a pint;
Rose water, one pint and fourteen ounces;
Orange-flower water, two ounces;
Spirits of salts, two scruples;
Burnt alum, two scruples;
Cochineal, one drachm.
All which digest and filter."

Expired 1805.

1791. Nicholas Dubois de Chemant.—For a composition for the purpose of making artificial teeth, either single, double, or in rows, or in complete sets, and also springs for fastening or affixing the same in a more easy and effectual manner than any hitherto discovered, which said teeth may be made of any shade or colour, which they will retain for any length of time, and will, consequently, more perfectly resemble the natural teeth than any now made.

SPECIFICATION.

"To make the mineral paste or composition of which the teeth are to be formed: Take thirty pounds of fine white sand, like that of Fontainebleau or Aumont, wash it well three or four times, until the water runs off very clear; dry the sand; then take ten pounds of Alicant barilla, pounded, and sifted through a coarse sieve; mix both ingredients well together, and place them under an oven or furnace (similar to that in which the tender or soft French porcelain or china is baked) till they are properly purified; take seven pounds of this composition, pound and sift it, then mix with it two pounds of the whitest and cleanest well-dried marl, moisten it in very clear water, and grind it in a mill (such as mustard grinders make use of) until it becomes very fine; then take it out and place it on plates of plaster to dry, and the paste is complete.

"To make other pastes, but of a quality inferior to the above: Take about half an ounce of English earth, such as earthenware is made of; add to it six grains of earth of Dombes, calcined, three grains of Naples yellow, and one drachm of Prussian blue; mix the whole together, as above, beginning with the blue, then the yellow, &c. Or take half an ounce of cabolin of Limoges, thirty-six grains of saffron of Mars, thirty-six grains of Naples yellow, one drachm of Prussian blue; mix the whole together as before. Or take half an ounce of the dust of French porcelain, six grains of saffron of Mars, six grains of earth of Dombes, calcined, six grains of Naples yellow, one drachm of blue, made of cobalt; mix and pound the whole as before. These pastes (the first excepted) have their colour in their formation; but in order to give a colour to the pastes first described, take four pounds and a quarter of it, to which add one quarter of a pound of saffron of Mars and one grain of Prussian blue, finely pounded; mix them well together. Or take twenty-four ounces of the same paste, one ounce of saffron of Mars, one grain of Prussian blue; pound and mix them as before. Or to thirty ounces of the same paste, add one ounce of saffron of Mars, one grain of Prussian blue; pound and mix them as before. Any of these compositions for different colours, according to the particular shade required, are to be mixed and worked up with this paste at the time of its being made.

"To make the teeth so as accurately to supply and fit the interval in the gums: Take a quantity of softened wax and place it in the mouth, which being then shut will give the exact impression of the cavity required to be filled up; in this wax is poured a

composition formed of plaster of Paris, such as is mixed for cornice moulds, which, when dry, gives a true and solid model of the mouth; either of the above pastes which you choose to use is then well kneaded, so as to make it flexible and compact, and is pressed into the plaster mould. The paste, having now acquired its proper shape, is taken out of the mould and laid on any flat and hard surface, and is dried either in the sun or before the fire; when it is so far dried as not easily to be put out of shape, carve out the teeth with a penknife or other sharp instrument to the form you wish, after which you place it in the oven on plates made of earth, such as are made use of for the French porcelain. As the paste in drying loses somewhat of its thickness, spread or widen the wax mould when taken out of the mouth to an increase in extent of about one seventh, which is done by pressing on the middle of it with the thumb and middle finger, and determine the space by compasses. Observe to bore such holes as may be necessary for the fastenings before the teeth are perfectly dry.

"To make an enamel: Take ten pounds of the best lead, six pounds of pewter; calcine both together, reduce the whole to powder, and pass it through a hair sieve; then take ten pounds of sand, such as that of Fontainebleau, four pounds of barilla of Alicant; mix them well together; sift them through a hair sieve; put them into a crucible of a proper size, and place it under the oven or furnace to be baked. Take ten pounds of this mixture, clean it well, and pound it very fine; add to it one pound of spermaceti and one pound of the best lead; then four pounds of borax; mix the whole together, and put them into a good crucible under the oven; afterwards, you clean and pound it well, and add to it as many ounces of red lead as there are pounds of enamel; moisten it with water, and pass it through the mill. This enamel, mixed with clean water, is now to be applied to the teeth with a hair pencil, after which the teeth are again put under the oven or furnace till the enamel is hardened, observing that the degree of heat must be milder than is necessary to purify the paste, as first mentioned. Observe, also, that the enamel must be laid on the paste formed of cabolin of Limoges in the same manner as is usual in common hard porcelain. That part of the teeth which is intended to represent the gums is coloured with such quantity of carmine, according to the shade required, mixed with spirit of turpentine, and laid on with a hair pencil, after which they are again placed in the oven, but in a still milder degree of heat, and when the colour is dry the teeth are fully complete."

The second part of this specification is a description of the spiral spring now in common use. Expired 1805.

1799. Robert Simpson.—For an improved instrument for extracting teeth.

This is a modification of the key, in which the tooth is seized by a *double claw*, and raised *perpendicularly* from the socket by a rotatory motion of the handle, an eccentric lever fixed to the shaft of the instrument near the claws, acting upon a fulcrum that rests upon the adjoining

tooth. There is, as in the case of the ordinary key, no control over the direction of the force used. Expired 1813.

1800. Joseph Sigmond.—For a preservative lotion and dentifrice. Expired 1814.

1825. John Palmer de la Fons.—For an instrument for extracting and method of fixing teeth.

The first part of this invention consists of a very complicated combination of the forceps and the key in one instrument. The second, in the use of flat or wire bands, made to embrace the natural teeth in any convenient manner, as now used, in order to secure a piece in the mouth. In some cases the inventor uses bands consisting of *two* pieces of gold, one lying over the other, after the manner of an ordinary carriage spring. Expired 1889.

1837. Richard Oake Millett.—For improvements in instruments for extracting teeth.

This invention consists in the substitution of a movable or jointed fulcrum or bolster, for the fixed fulcrum in the German key. Expired 1851.

1839. William Lukyn.—For certain improvements in applying and attaching artificial teeth.

This inventor proposes to substitute for the simple gold pin used in pivoting teeth, several forms of slit pins expanded at the base like an arrow head or the catch of a common necklace-clasp. The same contrivance is to be used instead of the solid pin and cement, for fixing artificial teeth to their bone or metallic bases.

The second part of his invention consists in the substitution for the spiral spring, in general use, of a *short* spiral spring about three fourths of an inch long, connected to each piece by the intervention of *long* wire levers, that of the lower piece being fixed, and the one attached to the upper moving on a swivel, as is usual. Expired 1853.

1845. John Tomes.—For improvements in making artificial teeth, gums, and palates.

The specification in this case describes,

1st, a mode of obtaining an exact impression of those parts of the mouth which are to be supplied with artificial teeth, gums, or palate.

An impression is first taken in wax, and a plaster cast made in the usual way. From this cast an impression is taken in a hard composition, and fitted carefully to the mouth; after which it is fixed in a frame, and by an ingenious and simple contrivance every part of it is traversed by a blunt point connected with a part of the machine that carries also a drill or cutter in rapid rotatory motion. The undulations, &c., of the blunt point as it passes over each part of the model are communicated with mathematical precision to the drill or cutter, which acts upon "the work," and carves out accordingly a facsimile of the model in the ivory or other material of which the piece is to be made; this also, as in the case of the model, being secured to a bed for the purpose. The inventor describes a method of producing a piece in every respect the *reverse* of the model, at the same operation as that by which he produces the fac-simile.

The hard composition is made as follows:

"I take about eight pounds of shell lac, blood lac, or lac, and place it in a vessel, and then place the vessel in a hot-oil bath, similar to those commonly used by chemists, and allow it to remain till the lac is melted; I then add two pounds of the solution of India rubber in spirits of turpentine or naphtha, as sold by Macintosh and Company; I add also six pounds of ivory dust, or plaster of Paris, or common chalk. The several ingredients are then thoroughly incorporated by stirring over the oil bath. I then pour the hot mass upon a warm slab of iron or stone, and by a roller reduce it to a cake of about a quarter of an inch in thickness; this I call dental moulding composition."

The second part of the invention consists of the machine by which the carving is accomplished, and would not be intelligible without a copy of the drawings that form part of the specification. This ingenious contrivance was intended to expedite as well as to render more perfect the formation of pieces in ivory, but the almost total abandonment of the use of ivory from our practice makes it of less value to the profession. Expired 1859.

(To be continued.)

Chemical Department.

PRACTICAL HINTS ON ELECTRICITY IN RELATION TO ELECTRO-PHY- SIOLOGICAL APPARATUS. By J. N. HEARDER, Electrician, Plymouth.

(Concluded from page 178.)

GALVANIC BATTERIES FOR CAUTERIZA- TION.

THE facility with which a small portion of platina wire can be made red or white hot by electricity affords the means of applying the actual cautery to isolated portions of the human frame, however inconveniently situated, and to which it would be impossible to apply such cautery by any other means.

It is exceedingly inconvenient and difficult, if not dangerous, to introduce the point of a red-hot wire into the mouth for the purpose of cauterizing the nerve of a tooth; although this has been frequently done, yet where the heat is sufficiently intense to accomplish the purpose effectually, the temperature produced in the mouth is such as few patients can bear without flinching. With the electrical cautery, however, the matter is altogether different; a short piece of platina wire, bent in the form of the letter V, having its two ends attached to a pair of small forceps, has its apex adjusted delicately upon the nerve to be acted upon. Whilst in this position no sensation is felt, the wire being cold. Matters being thus adjusted, the operator presses gently on a small spring in the handle of the instrument which holds the wire, and the circuit is immediately completed between the wires of a voltaic battery previously attached to the other end of the instrument for that purpose. The platina wire instantly becomes red or white hot, according to the strength of the battery, but as quickly becomes cold again when the operator ceases to press the spring. The whole affair may be done, if required, in a single second. Various directors have been contrived for this purpose, and the practical dentist may easily invent extemporaneous instruments of this kind to suit every possible requirement, the only precaution necessary being to keep the two wires to

which the ends of the platina wire are attached separate from each other by the interposition of any non-conducting substance, such as ivory, wood, gutta serena, card, paper, or the like. The size and construction of the battery necessary to produce the ignition of the platina wire will depend upon the nature of the elements employed.

Those usually sold for the purpose consist of five or six Smee's batteries, each containing from eight to sixteen square inches of platinized silver plate, measured on one side only, and a pair of zinc plates to correspond.

These batteries are fastened to a beam of wood, and are connected in series, the zinc at the first battery communicating with the silver of the second, and so on through the series. The whole is fixed in a frame, and by means of a handle attached to a roller in the top, over which two strings pass, the batteries can be wound up out of the cells when not wanted for use, and can be lowered to any required depth into the acid at pleasure. This is a very nice arrangement; care, however, must be taken to keep the zinc plates well amalgamated, and the silver plates properly platinized and clear of mercury.

The substitution of platinized carbon for silver plates is, as has been before explained, a great improvement, as there is no fear of injury by contact with the mercury, and they are, moreover, more intense in their action.

If the nitric-acid battery be used, two cells, the platina plates of which measure two inches by four, will be sufficient for all purposes. They must, however, be excited when required to be used, as they will not remain quiet more than a few hours, when decomposition of the nitric acid begins to take place.

The cheapest and most powerful form is the modification of Callans's battery, contrived by the author, and described page 442, consisting of an iron cell, enclosing a flat, porous diaphragm, which also contains a plate of zinc.

The iron cell is filled with a mixture of equal parts water, nitric and sulphuric acids, and the porous diaphragm contain-

ing the zinc, is charged with a saturated solution of hydrochloride of ammonia. A pair of these cells, of four inches square in the side, will ignite two inches of platina wire as thick as a fine sewing needle. The cost of such a battery does not exceed 12s. Like the nitric-acid battery, however, it requires to be used within a few hours after being excited, and when required for daily use should be cleaned and charged fresh every morning. Upon the whole, the carbo-zinc battery first described will be found the most convenient, since the operator, having adjusted his platina wire and made contact by pressing the spring in the handle previously to immersing the batteries in the acid, can then gently lower them until the wire attains the desired temperature, fixing them at this point by the little ratchet wheel which the author attaches to his batteries for this purpose. By this means the greatest accuracy of effect is ensured. In bringing this series of papers to a conclusion, the author feels that they have run to a much greater length than he originally contemplated. His desire has been to explain the principles involved in the action of the apparatus most likely to be employed in dental physiology. If he has been too prolix, the infliction is now at an end, but if he shall have succeeded in communicating any amount of scientific information to those previously unacquainted with the subject, he will feel amply repaid for the time and labour involved in the task which he most cheerfully imposed upon himself.

ON DEATH FROM CHLOROFORM.

By W. MARCET, M.D., F.R.S., Assistant-Physician to the Westminster Hospital.

(From the 'Medical Times and Gazette,' July 20th, 1861.)

THE case of death from chloroform, reported by Dr. Dobbie in the 'Medical Times and Gazette' for the 29th of June, induces me to offer your readers a few practical observations on this subject.

When chloroform is inhaled, and consequently brought into contact with the air-cells of the lungs, it passes rapidly into the blood, by means of which it is carried to the brain. If the administration of the anæsthetic agent be suspended, the chloro-

reform will be eliminated from the body by the respiration, each inspiration displacing most of the vapour contained in the blood exposed by the lungs to the action of air during that inspiration. The elimination from the blood of any very volatile substance possessed of a stable chemical composition may be considered, as a rule, to take place through the lungs. This might have been anticipated by a consideration of the displacement of the carbonic acid of the blood by the air inspired, and has been placed beyond doubt by a well-known beautiful experiment of Claude Bernard, where an aqueous solution of sulphuretted hydrogen being injected into the blood of a dog, the animal in the course of one or two minutes expires the whole of the poisonous gas. Messrs. Lallemand, Perrin, and Duroy have shown experimentally that this law is applicable to chloroform, and, consequently, there is not the slightest doubt that when blood contains chloroform it is removed therefrom by means of respiration.

If the air inspired be pure, the displacement of chloroform from the blood in the lungs will be very great; if this air should contain chloroform the displacement will be less, just as when air containing a large proportion of carbonic acid is breathed, the removal of the carbonic acid of the blood is checked. When a patient begins to inhale chloroform, a portion is absorbed by the blood, the remaining is expired; but shortly afterwards, in addition to the expiration of that part of the chloroform which has not been taken up by the blood, a certain quantity of that which has been absorbed is also ejected, being displaced by the air mixed with the chloroform inhaled. At this stage, however, there is still an accumulation of the anæsthetic agent in the blood, more being taken into the circulation than given out; gradually complete insensibility is produced, and the handkerchief is removed from before the face of the patient; he now begins ridding himself rapidly of the chloroform, and recovers consciousness, unless more of the anæsthetic agent be exhibited. By the careful administration of chloroform the state of insensibility may be kept up for a considerable length of time; during this period it is obvious that the accumulation of the vapour in the blood no longer takes place, otherwise it would invariably produce death; there must consequently be an equilibrium between the quantity of chloro-

reform absorbed, and that which is displaced and eliminated by the process of respiration. If, during this stage of insensibility from any cause whatever, the power of absorption of the blood for chloroform be suddenly increased, or its property of giving it out to the air inspired be diminished, then death will take place from an accumulation of the vapour in the blood. It is difficult to imagine that the power of blood of absorbing the substance under consideration should be suddenly increased; but there is a very simple cause impairing its elimination from the blood, viz., the administration of the chloroform vapour in too concentrated a condition. Just as an excess of carbonic acid in the air prevents or interferes with the elimination of that contained in the blood, so must an excess of chloroform in the air prevent or interfere with the exit of chloroform already existing in the blood; therefore, the blood goes on taking up chloroform, and giving out less than a quantity equal to that absorbed, at the same time the evil may be increased by a few deep inspirations taken unconsciously, although apparently with the view of ejecting the poison, and life is suddenly extinguished.

This view would perhaps partly account for the case of death reported by Dr. Dobbie; in addition to which I might observe, that the patient being a drunkard, we may assume that the action of his lungs was more or less impaired from their being continually engaged with the elimination of alcohol; the delicate membrane of the air-cells was, probably, thickened, which at first acted more or less as an obstacle to the admission of chloroform into the blood. A statement of the author referred to, appears to support the present assumption; he observes, "for two or three minutes he (the patient) did not come much under the influence of the drug (chloroform), inhaling it, however, readily enough." It was, therefore, apparently some time before the patient could be narcotized, as is the case, if I mistake not, with most drunkards. The exhibition of chloroform being continued, more of it found its way into the blood, while we may surmise that the elimination of the vapour already absorbed was checked from the thickened condition of the pulmonary membrane, which interfered materially with the action of the air inspired along with the chloroform; or, in other words, the chloroform passed through the lungs into the blood, while the air was unable to

do so with a sufficient degree of readiness to remove an equal quantity of the vapour out of the blood; from this circumstance there resulted an excessive accumulation of chloroform in the blood.

From the foregoing observations we may conclude—

1. That chloroform must be administered cautiously, and its effects watched with particular attention, if, although the vapour be freely inhaled, the patient does not become insensible within the usual time.

2. That in every case where chloroform is administered, as soon as the state of insensibility is obtained, the vapour must be exhibited diluted as much as possible with pure air; and air free from the anæsthetic agent ought to be allowed frequently into the lungs to remove the excess of the vapour present in the blood.

3. That during the administration of chloroform great attention should be paid to the state of the respiration, which ought to guide the exhibition of the anæsthetic agent still more than the condition of the pulse. If the inspirations become less deep and respiration appear failing, air free from chloroform ought to be immediately allowed into the lungs, not only because this state of the respiration is an indication of there being an overdose of chloroform in the blood, but also because the diminished respiration is in itself a cause of danger by preventing the blood from ridding itself of the chloroform it contains.

4. That when a patient has sunk under the effects of poisoning by chloroform the only means of restoring animation is by artificial respiration, adopting such method as is best calculated to introduce as much air as possible into the lungs in order to remove the poison from the blood, at the same time stimulating the action of the heart.

It is due to Messrs. Lallemand, Perrin, and Duroy to state that they have already called attention to the importance of looking closely to the respiration during the administration of chloroform; but these gentlemen have overlooked the fact that the presence of an excessive proportion of chloroform in the air inspired must act more or less as an obstacle to the elimination of the vapour which has already been absorbed—a circumstance which ought to be taken into consideration on every occasion where chloroform is exhibited.

4, George Street, Hanover Square.

Hospital Reports and Case-Book.

NECROSIS OF THE UPPER JAW IN A LUCIFER-MATCH MAKER.

(*From the 'Medical Times and Gazette,'
July 20th, 1861.*)

IN this journal for February 16th, 1861, we gave the particulars of a case of necrosis of the lower jaw occurring in a lucifer-match maker. We now have to record a case in which the upper jaw was affected. In our number for June 8, 1861, page 610, under the head of "The Medical Congress" (at Zurich), is an interesting *resumé* of the chief points connected with lucifer-match makers' disease. In this country it is generally believed that the upper jaw is very rarely attacked, and in the article alluded to it is stated that of eleven cases detailed by Professor Billroth, in two only was the upper jaw affected. Mr. Erichsen, in his work on surgery, writes, "Both jaws are *equally* liable to be affected; but commonly only one at a time is diseased. Thus, of 51 cases collected by Von Bibra, both jaws were only affected in 5 instances—the upper alone in 21 cases, the lower in 25."

Frederick S—, æt. 28, was admitted an out-patient under the care of Mr. Coote, a few weeks ago. He then had great swelling of the right cheek, and just below the eyelid was a sinus, leading to diseased bone. The whole of the upper jaw on this side was found to be more or less diseased. The bone on the other side was also, to some extent, affected. He could scarcely breathe through the nostrils. He had been a lucifer-match maker for eighteen years; but only began to suffer from it three years ago. He had no other special symptoms further than those general constitutional ones due to the irritation and discharge of the local disease mentioned. The smell was fetid and disgusting.

He was subsequently admitted an in-patient, under the care of Mr. Wormald, who, on July 9th last, removed the whole of the upper jaw, with the exception of the part forming the floor of the orbit. By one long incision by the side of the nose and through the lip he was enabled to ex-

pose and remove the disease. The man has since progressed favorably.

EXCISION OF THE SUPERIOR MAXILLA—CLINICAL REMARKS.

(KING'S COLLEGE HOSPITAL. Under the care of
Mr. FERGUSSON.)

(*From the 'Medical Times and Gazette,'
May 25th, 1861.*)

THE following particulars of this interesting case were gathered from Mr. Fergusson's clinical remarks after the operation. The patient was a woman, aged 28. She had for thirteen years had more or less disease about the right upper maxilla, and seven years ago a tumour had been removed from the cheek. This was, Mr. Fergusson believed, probably not connected with the jaw. He had first seen her twelve months before. There was then, in addition to the disease of the jaw, a tumour situated over its front aspect, free and moveable. This was an unusual complication, and rendered the case, as Mr. Fergusson then believed, one unfavorable for operation, as suggesting malignancy. There was no enlargement of the glands of the neck; but this, he said, was not common even in cases decidedly malignant. She was sent to him with a view to an operation, but he did not recommend it. He expected that the disease would rapidly progress, and that her life would be short. He was, therefore, somewhat surprised to see her again one day lately, presenting no change in general appearance. He was, therefore, induced to consider the operative aspects of the case more carefully. There was some increase in size, and projecting into the mouth through the hard palate was a soft, elastic, rounded mass. It had also ulcerated, and there was a sloughy, ulcerated condition of the palate round it. He was able to squeeze his fingers into the antrum, or, at least, into a space above the palate. She could blow through both nostrils, and thus it was seen that these parts were free. As he found that the

disease had made such slow progress, and that her constitution continued good, he determined, as it was a question of life or death, to attempt the removal of the disease.

In reference to the operation, Mr. Fergusson said, that he had many debates as to the best method of proceeding. He was not able to adopt in this case, on account of the great extent of the disease, his favorite incisions. His usual plan was to make an incision in the centre of the lip, and then to carry it into the nostril on the side affected, and dissect up the lip and ala nasi in one piece, or if more room were required, to carry the incision on the outside the nose, and of then dissect up the lip and cheek. In the present instance, however, the incision required to be more extensive, as he had to remove most of the upper jaw, and also part of the soft palate; therefore, in addition to those above mentioned, Mr. Fergusson carried an incision outward about a quarter of an inch below the orbit. This plan was, he said, much to be preferred to the method often practised of carrying an incision outwards and upwards from the angle of the mouth. On reflecting the cheek the superficial tumour was exposed and squeezed out of its capsule. It was, as predicted, quite free. The bone was chiefly removed by the bone-pliers and cutting-forceps. Mr. Fergusson, however, first by the saw weakened the attachment of the superior maxilla to the malar bone, and applied it also to the alveolar border of the bone near the middle line. Having done this he broke away the alveolar ridge and removed it, and then, piece by piece, removed the whole of the bone, except the orbital plate, and that forming the upper part of the antrum. On subsequent microscopical examination, it was found that the tumour was not malignant.

ADMINISTRATION OF CHLOROFORM BY THE NOSTRIL IN OPERATIONS ON THE MOUTH, &c.

(From the 'Medical Times and Gazette,' May 25th, 1861.)

In the above case the patient was kept fully under the influence of chloroform by Dr. Sansom by means of chloroform inhaled through the nostril. This was

first done in London by Dr. Richardson, in a case where Mr. Spencer Wells removed half the lower jawer. Dr. Sansom's method is a modification of that adopted by M. Faure, and described by him in *L'Union Médicale* for 1860. He employed it in all cases in which chloroform was to be given, and designed that the mouth should be closed, so that one nostril should receive the tube conveying chloroform vapour, and the other should remain patent to the external air. By these means he felt assured that due dilution of the chloroform vapour in the lungs would be attained. Dr. Sansom adopts a somewhat modified method only for prolonging anæsthesia in cases of operation in which the ordinary means for the exhibition of chloroform interferes with the manipulation of the operator, in operations on the mouth, &c. The apparatus is simple. A glass reservoir, capacity two ounces, is connected at its upper part with two tubes; one of glass very short, of nearly half an inch in diameter, and terminating in a funnel-shaped extremity open to the air; the other a flexible tube, of one quarter of an inch in diameter, and about eighteen inches in length, with an extremity adapted to the patient's nostril. The patient is first brought under the influence of chloroform in the usual way. When the operator commences the manipulation upon the mouth, a drachm of chloroform is poured into the glass reservoir through the funnel-shaped extremity of the glass tube; the reservoir is then shaken so as to project the chloroform against the sides, and thus favour the evaporation. The flexible tube is then pushed up one of the nostrils of the patient, so far as it will penetrate with gentle force. The patient now breathes by one nostril air impregnated with chloroform vapour, by its passing over the evaporating surface in the reservoir, and by the other nostril and by the mouth pure atmospheric air. The free nostril is used as a valve, to be closed or left open according as the patient requires more or less of the anæsthetic. The mouth remaining open, there is quite sufficient dilution with air ensured, although the free nostril be completely closed. The flexible tube admits of the apparatus being moved anywhere out of the operator's way. In the present instance the patient was kept well under the influence of chloroform, the administration not interfering at all with the operation.

British Journal of Dental Science.

LONDON, AUGUST, 1861.

THE force of the adage, that "those who hide know best where to find," is well exemplified by the second letter of the President of the College of Dentists, which appears in the 'Lancet' of August 10th, and which we republish for the benefit of our readers. That gentleman and his colleagues in the council of the College of Dentists having, for reasons sufficiently obvious, hidden what they now say was the real meaning of their letter of June last in phraseology calculated to convey to the minds of their readers a very different impression, affect to be very indignant when their device is seen through and exposed, and say that the letter bore no such meaning as that which has been put upon it by the 'Lancet.' We will take upon ourselves, however, to say that no ordinary reader—no one not in their secret—could have put any other construction upon it than that which the 'Lancet' has done. It is the plain and self-evident meaning of the sentence, if there be any meaning in the English language; and it would have required the foreknowledge of the 'hidiers' themselves, or of their abettors, to discover the now asserted meaning of this ingenuous (?) composition.

Our cotemporary of the 'Dental Review,' in his last leader—which is evidently written under much smarting—says, defending Mr. Waite's explanation, "Mr. Waite, in his letter, states that the College of Dentists is "constituted"—mark the word "constituted"—on the same plan as were other institutions which have ventured to call themselves colleges," and charges the writer in the 'Lancet' with quibbling in dealing with Mr.

Waite's letter. Now Mr. Waite's words were, "We are in every particular constituted as many other colleges—such, for instance, as the College of Preceptors, the Agricultural College, and the College of Civil Engineers"—the two first chartered, and the last an extinct institution.

Is there no difference, we ask, between the statement "we *are* in every respect constituted," &c., made by Mr. Waite, and the ingenious paraphrase of our cotemporary—a quotation of Mr. Waite's entire sentence would not have answered his purpose—given above? Does not the use of the present tense by Mr. Waite plainly imply—does it not plainly *mean*, according to all the rules of English grammar and composition—we *are now* in the same position as are the colleges referred to? And is not the substitution of the word *were* by our cotemporary, in arguing this point, as plainly a QUIBBLE—if not a direct departure from truth? Does not, in fact, his own charge against the 'Lancet' of quibbling recoil upon himself? We are satisfied that our readers will agree with us that the meaning put upon this passage in Mr. Waite's letter by the writer in the 'Lancet' is the obvious one, and that our cotemporary, feeling this, was forced to resort to this subterfuge to bolster up his otherwise untenable argument.

Mr. Waite's first letter is a carefully drawn-up composition, and having been put forth in the name, and signed by him on behalf of the council, must be regarded as an official document, and one not open to the excuse of inadvertence. We must consider it as conveying the deliberate meaning of his colleagues and himself,

and take it, therefore, as it stands—in doing which, we repeat, that we fully agree in the views taken of it by the 'Lancet.'

We are constrained to say that we regard Mr. Waite's second letter as being even more disingenuous than his first. It is full of gratuitous and groundless assumptions, and abounds with false reasoning. The sophistry resorted to in it, in attacking a former council to excuse his own and his colleagues' delinquencies, is perfectly unjustifiable, and only tends to betray the weakness of his cause. The fallaciousness of this, and of his other arguments, however, have been so fully exposed by the 'Lancet' that we consider it unnecessary to enter upon them at any length here.

The absurdity, disingenuousness, and we may add *impolicy* too, of the attempt made both by Mr. Waite and by our contemporary to lead their readers to believe

that the 'Lancet' could only produce four examples of advertising among the members of this College, because only four were originally named, must have been patent to all those at all acquainted with the real state of this question—and has, like most of their tortuous proceedings, brought its own punishment upon the College, by causing the publication in detail of the names of thirty-one of its advertising members. We think the members of this College (and the other readers of the 'Review'—"if any such there be"—) must surely now have had examples enough forced upon their notice to convince them, at least, that their body is not so immaculate as its president and council would fain have us believe.

Verily, the deeper our unfortunate friends in Cavendish Square enter into this argument, the more hopelessly do they seem to plunge into the mire!

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

DENTAL APPOINTMENTS AT MILITARY HOSPITALS.

To the Editor of the 'British Journal of Dental Science.'

SIR,—After the statement of the Medical Director-General of the Army, "that no dental appointment has been made to Fort Pitt or any other military hospital," it must be evident that "the Dentist to the Hospital" misunderstood the nature of his position in connection with that establishment. It is quite possible that when the Director-General adds in his reply, "but the principal medical officer at Chatham has been informed that he is at liberty to request the services of a gentleman residing at Chatham in any case which he may think necessary," this gentleman *may be* Mr. Cox Smith, although his residence

would appear to be, Brewer Street, *Maidstone*. (See published list of members of the College of Dentists of England.)

Supposing this to be the case even, the language and inferences of the 'Dental Review,' when commenting upon his alleged appointment, are unjustifiable. At p. 158 (April, 1861) it says, "It" (Government) "has filled up that appointment by the election to the trust of Mr. Cox Smith, of Chatham, now Dentist to the Fort Pitt establishment. In making the *selection*, our authorities have done at once a wise and a liberal act," &c., &c. "They have elected a staunch defender of the independent section of dentists, and therefore they are liberal as well as wise. The precedent is worth a charter; it is a tacit recognition of right by the highest authorities in the realm."

It became the duty of those who were acquainted with the *real facts* to dispose of

this *precedent*; and Mr. Cox Smith having openly embraced the view of this subject taken by the 'Dental Review,' by assuming the title of "Dentist to the Hospital," he has now only himself to thank for the unpleasant way in which his name has been dragged before the public. He may rest assured, however, that it was no personal feeling towards himself which occasioned the calling in question of this appointment. He may be fully qualified to fill with credit the post to which he considered himself elected, and if so, I trust that he may ultimately obtain it; but I cannot bring myself to believe that the possession of the diploma of the College of Dentists of England will in any way forward his appointment.

I am, Sir,

Yours, &c.,

X.

SOME REMARKS ON THE LAST BALANCE-SHEET OF THE COL- LEGE OF DENTISTS.

*To the Editor of the 'British Journal of
Dental Science.'*

SIR,—I promised to send you a copy of the balance-sheet of the College of Dentists for the session of 1860-61, together with a few remarks thereon. The observations I have to make will take the form of questions principally—questions which naturally arise out of a cursory examination of the accompanying sheet. In the first place, I ask whether the Metropolitan School of Dental Science was instituted by and with the knowledge and consent of the members generally? I venture to think it was not, and, moreover, that when the said members expressed surprise at the Council having taken the office upon themselves, the step was justified and the "quietus" administered, by the Council asserting it to be "a private speculation." Under this form it certainly has passed current among the members of the profession, generally, and, and if I mistake not, this opinion received its confirmation by the payment of one guinea for the use of the premises by the School to the College. How then am I to understand the item, "Sundry expenses—Work-bench and other fittings for

Metropolitan School of Dental Science, £27 10s. 4d.? The Council will, no doubt, be very happy and willing to explain this. I hope I may not be deemed inquisitive; but even at that fearful risk, I should be glad to know whether the £42 put down as "Lecturer's fees" went into the pockets of the 'College' or the 'School' lecturers? I have never seen the glorious medals distributed by the Council to the proficient members, but I suppose they are of too massive a character to allow of more than those given by the Council being included in the sum stated against them in the balance-sheet. I find no mention of the Rymer Medal in the report. Is that stimulus to exertion still continued?

I am not in the habit of looking through keyholes, or listening at walls, but something has reached my knowledge, which I think should be stated. I am informed that a proposition once was made by one of the members of Council to introduce a stringent declaration to uphold the *dignity* and *honour* of the profession by all candidates for membership, and that this same proposal was met by a rude "Tush! tush!" and fell through for want of a seconder. Am I rightly informed? If this should have been correct we can well understand how education was to be pushed forward without a curriculum; how a large flaring certificate was planned, whose size alone conveys anything but the idea of true worth and respectability, and which is fit for nothing but the exhibition of the art of engraving; and how this same College *will have members*, even at the expense of lowering a useful and honorable profession to the rank of a second- or third-rate trade—so far as the expense of acquiring it is concerned. The President, in the conclusion of the report, "congratulates the members on the position of the College," but can he do so really and truly when, in an impartial manner and with unbiassed mind, he calculates the chances of success, and connects with them the means he is adopting and the end he has in view? I doubt it. If my time and your space were unlimited, I could say more; but waiting another opportunity,

I am, Sir, yours, &c.,

INQUIRER.

(For Balance-Sheet referred to, see next page.)

THE TREASURER IN ACCOUNT WITH THE COLLEGE OF DENTISTS OF ENGLAND.

1860.	Dr.—Cash.	£ s. d.	1860.	Contra.—Cr.	£ s. d.
Members' Subscriptions		317 2 0	Transactions for 1860		30 0 0
Geologists' Association, Rent . . .		25 0 0	Rent of Premises		130 0 0
			Printing		40 0 0
			Postage and Envelopes on account of Protest of the Medical and Dental Professions		68 14 0
			Mr. Peter Matthews, for Clerks, folding and addressing Envelopes and Cir- culars		13 0 0
			Sundry Expenses connected with Pro- test		4 3 9
			Postage and Stationery		8 11 3
			Advertisements		12 8 0
			Reporters and Transcripts		4 15 0
			Engraving Certificates of Membership by Election and Examination (Moring)		30 0 0
			Design and Sketch for Certificate (Murray)		1 10 0
			Medallist for College Seal (Taylor) . .		10 10 0
			Gold and Silver Medals		5 5 0
			Lecturers' Fees		42 0 0
			Expenses connected with Conversazioni and Monthly Meetings—Refresh- ments, &c. . . .		20 1 3
			Repairs—Carpenter, Gas-fitter, &c. . .		6 4 6
			Sundry Expenses—Work-bench and other Fittings for Metropolitan School of Dental Science		27 10 4
			Gas, Coals, and Firewood		4 17 7
			Medical Publications		0 10 10
			Cousins—Salary for Attendance . . .		16 5 0
			Sundries, including Cab-hire		11 3 3
					487 9 9
			December 31st, 1860. Balance		59 13 0
					£547 2 9
December 31st, 1859. Balance		205 0 9	Examined and approved by the Auditors, THOS. C. VIDLER. CHAS. STODDART.		
		£547 2 9			

JAMES ROBINSON, Treasurer.

Literary Notices and Selections.

COLLEGE OF DENTISTS.

(From 'The Lancet,' Aug. 10th, 1861.)

THE letter which we publish from the pen of Mr. Waite on behalf of the College of Dentists in no way controverts our statements or modifies our opinions. Through our columns he told the medical profession that "we (the College of Dentists) are in every particular constituted like many other colleges," naming as examples two corporate bodies. If this statement

means anything, it means that in constitution there is strict similarity, and conveys to the reader a distinct impression that the College of Dentists is acting under recognised authority equal to that possessed by the colleges cited. The excuse that it is universally known that the College of Dentists does not possess a charter—in other words, that it assumes the power of a corporate body without constituted authority—could not be pardoned even if dentists only were addressed; but

in an appeal to the medical profession, the members of which know little of the College of Dentists, the implied statement that this latter, an indifferently supported private society, is a constituted authority, a chartered body, admits of no justification. That our quotations of dental advertisements were limited to four examples arose from want of further space. We will now add the names of other members of the College of Dentists who use advertisements, annexing the dates of their election:—G. W. Bellaby, Nottingham, elected in 1857; H. R. Brooks, Banbury, 1857; E. Dagnall, Battersea, 1856; A. Fothergill, Darlington, 1856; W. Fothergill, Darlington, 1856; H. J. Garnett, Sheffield, 1857; T. G. Hayman, Bristol, 1856; S. A. Hayman, Bristol, 1856; W. H. Howlden, York, 1857; A. Jones, Cambridge, 1857; S. Little, Bristol, 1856; J. D. Morrison, Edinburgh, 1857; B. L. Mosely, Hull, 1858; S. Mosely, Hull, 1856; G. Mosely, Sheffield, 1857; E. Neep, Norwich, 1856; D. T. Nightingale, Newcastle, 1859; T. Penny, Lincoln, 1859; T. Robertson, Bath, 1856; F. A. Sayles, Lincoln, 1857; F. J. Sims, Birmingham, 1857; H. L. Spencer, Orchard-street, 1856; C. Stoddart, London, 1856; W. R. Tuck, Cramborne, 1857; W. F. Vernon, Edinburgh, 1857; G. Wayling, Bury St. Edmunds, 1856; G. Weaver, London, 1857; E. Williams, Malvern, 1857; B. Wilkins, Northampton, 1859; T. D. Wotton, Truro, 1857; W. R. Wood, Brighton, 1856.

We will further add the following advertisement, and a copy of a letter from the Director-General of the Army Medical Department, published in the 'British Journal of Dental Science':

"Mr. Cox Smith, Member of the College of Dentists; Dentist by appointment to the Military Hospital, Fort Pitt, Chatham; to the Rochester, Chatham, and Stroud Dispensary; to the Kent County Ophthalmic Hospital, Maidstone, may be consulted at his residence, at 7. Brewer-street, Maidstone, on Tuesdays, Thursdays, and Saturdays; and at his late residence, at Halmond-place, Chatham, on Mondays, Wednesdays, and Fridays, from ten to five o'clock."—*'South Eastern Gazette,'* Maidstone, July 23rd, 1861.

"Army Medical Department;
11th July, 1861.

"SIR,—In acknowledging the receipt of your letter of the 6th instant, I have the honour to inform you that no dental ap-

pointment has been made to Fort Pitt, or any other military hospital; but the principal medical officer at Chatham has been informed that he is at liberty to request the service of a gentleman residing at Chatham in any case that he may think necessary.

"I have the honour to be, Sir,

"Your most obedient, humble servant,

"J. GIBSON, Director-General."

The list of members published in the 'Transactions' of the College of Dentists during the present year contains 135 names. Appended to this list we have the names of thirty-two associates who are dentists' apprentices, pupils, or artisans. They are not dentists in practice, and cannot be regarded as members of the College; yet Mr. Waite would have us believe, in the absence of any distinctive appellatives on his part, that our selection of advertisers was made from 167 members. We do not see what advantage Mr. Waite proposes to gain by stating that the College he represents is unacquainted with the habits of its members, or, after several years of office, by casting blame upon his predecessors for their treatment of a question with which he is himself perfectly competent to deal. The plea of ignorance and the use of recrimination comes very badly from men who leave no stone unturned to maintain an equivocal position. We regard dental surgery, now affiliated to the medical profession, as an important branch of surgery, which, in a public point of view, commands our attention; and the opinions we have from time to time expressed depend upon perfectly authentic information, obtained from unquestionable sources. We have but one object in view, and that is to see the dental surgeon properly educated, and placed in a high professional position; and the evidence before us forces the conviction that the College of Dentists, while answering no useful purpose, tends, by its palpable encouragement of unprofessional practices, to retard the fulfilment of these very desirable results.

We are weary of the unmeaning twaddle constantly reiterated by the College of Dentists, and introduced in each of Mr. Waite's letters, about the interests and good feelings of the medical profession. The profession is quite competent to protect its own interests, and needs not the intervention of the College of Dentists. The boasted support of medical practi-

tioners, gained at the cost of candour by the publication of a notoriously one-sided statement, adds nothing to the credit or the strength of the College of Dentists, and we would recommend Mr. Waite in his future efforts to leave this part of the tale untold.

LETTER FROM MR. WAITE, REFERRED TO
IN THE ABOVE ARTICLE.

(From the 'Lancet,' Aug. 10th, 1861.)

To the Editor of the 'Lancet.'

SIR,—I regret again to have to ask you to allow me a few lines of reply to your last annotation on the proceedings of the College of Dentists.

In the first place, I have to complain that you misinterpreted the meaning of the observation made in my previous letter, that "we (the College of Dentists) are in every particular constituted as many other colleges." It were, of course, easy to put your construction on this statement, and to draw from it the assumption that the Council of the College claimed to be a chartered body. But in reality there was no such intention conveyed in the terms used. My simple and easily understood meaning was, that the College of Dentists was constituted—that is to say, brought together or established—as were the colleges named. The fact that one of these colleges has ceased to exist, and that the others after their institution obtained charters of incorporation, has nothing to do with the question, inasmuch as the obtaining of a charter did not alter their constitution, but only confirmed it. I might perhaps have used the word "instituted" for "constituted;" but it did not occur to me for a moment that the construction you have given to my words could have possibly been applied, seeing that it was universally known that the College of Dentists did not possess a charter.

In the second place, you charge the Council with having in the list of members certain advertising persons, four of whom you mention by name. The answer to this charge is comprised in the simple fact that these four gentlemen were not brought into the College by the present Council, but were admitted by the very persons who are now so strongly opposed to us; a circumstance which no doubt enabled them so readily to furnish you with the names of those who are advertising in a manner contrary to the laws of the College, and

which the Council themselves were not aware of.

These four names were placed on the College list during the first and second years of its establishment, at a time when not more than seven members of the present Council formed part of the executive of the College. By reference to the records of the College, I find that in December, 1856, a Committee of Scrutiny was appointed to revise the list of members, and finally to decide who were fit and proper persons to be retained, and who should be rejected. This committee returned in their list of the gentlemen who were eligible for membership the names of Dagnall and Wotton, and did not exclude those of Neep or Moseley, who were already on the roll, and whose names remained on the College list when the members of the Council to whom I have referred resigned in 1858, nearly twelve months after the report was made by their own Scrutiny Committee, and during which time they continued to receive the subscriptions and recognise as members of the College the four gentlemen whom they now hold up to professional condemnation.

I cannot help thinking that it says much for the proceedings of the present Council, that the enemies of the College, when endeavouring to place it before the public in the worst possible light, could not select, out of a list of 167 names, any other than the four which they themselves left as a legacy to their successors, and who remain rather as evidence of their own neglect and culpability than of any desire on the part of the present Council to countenance such advertisements as these gentlemen are charged with issuing.

Feeling, sir, that with us, as with every other public body, there are always errors to be corrected, we shall be glad to have them pointed out, whether by friends or enemies, and in so far as we are able will endeavour to correct them. But let our adversaries be assured that we shall not allow ourselves to be crushed by insult, nor shall we cease doing what we believe to be a useful work by the mere intimation of a section of opposing dentists (not more numerous than ourselves) that we must subside to their dictation. If we are comparatively small as a body, such is our unitedness that our means have always been in advance of our necessities. We are steadily increasing in numbers; the younger members of our profession are coming to us eagerly for instruction and alliance; the medical profession has

strongly backed us when we have appealed to it, and altogether we have every reason to be satisfied with our success. Further, we have a principle in view: we are anxious to be on terms with the medical profession, but not to constitute a sub-section of it. We believe we are distinct as a profession, and should stand as separate for the advantage of your profession, our own, and for the public.

I have the honour to be, sir,

Your obedient servant,

GEORGE WAITE, M.R.C.S.,
President.

College of Dentists,

5, Cavendish Square;

July 29th, 1861.

DENTAL QUACKERY.

(From *An Address before the American Dental Convention, at Niagara Falls, August 5, 1859, by E. T. Wilson, M.D.*)

It is a portion, and no small portion, of the pledge tacitly made by the youthful physician, surgeon, or dentist, when he receives at the hands of the faculty a diploma of skill and learning, "that he will discountenance, and, as far as in him lies, put down all who would pursue his road without the necessary qualifications." Admitted that it may embroil him in unpleasant altercations, strifes, and bickerings;—admitted that the masses may not always distinguish between the philosopher, battling for a principle, and the empiric battling for a fee;—the great interests of the science entrusted to his keeping, the dignity of wisdom and the future progress towards perfection of the profession he has chosen, demand of him that he will make no compromise with false professors, nor cease "to cry aloud and spare not," while unworthy Samaritans are within the temple gates.

If I were called upon to give the characteristics of an irregular dentist, in contradistinction to the opposite class, I would note two points of distinction. First, a disposition to follow the dictates of popularity rather than conscience; second, a disposition to win the way by means other than those of experience and merit. The evidences of the former are seen in a willingness to humour the whims of patients, to perform operations of temporary value only, to seize upon every novelty of the day at the expense of sound work, and

generally to make the street and the forum a part of the operating room.

The life and soul of a quack business is ostentation. A modest man will plant himself upon his merits, and will wait for the world to come to him; and I believe I am safe in saying that, as a general rule, the most meritorious man will be found to be the most modest. It is ignorance, and pretension, and assumption, and wild and headstrong arrogance which seeks by adventitious arts to atone for gross deficiencies; which attempts, by bluster and display, to blind society to professional incompetency. It is the want of dexterity and skill which impels a practitioner to tell what he can do, instead of doing it silently and surely, and trusting to his handiwork as the voucher for his ability.

But it is more sensible,—it will be more agreeable to our fellow-creatures, and we shall be more likely to make real advances in our profession, if we keep tolerably quiet, relying upon doing well whatever our hands may find to do. One patient, skilfully and permanently relieved, becomes your friend and patient for ever after; and you will probably fill, extract, and set for his whole family,—for his children, and if you live long enough, for his grand-children, to say nothing of the collateral advantage which you will derive from the smiles of his uncles, aunts, and cousins. The best advertisement a dentist can have is a thorough piece of work, for his patient cannot smile or speak, cannot eat, and cannot even yawn without advertising him in the best, and puffing him in the only tolerable way. As for his patients, private and personal gratitude, there will be no end of it. When he eats his Thanksgiving dinner, when he speaks in the pulpit, the bar and the forum, or in any other public place, he sits down or rises only to call you blessed. The gratitude of such a friend is worth having, whether he pays his bill without growling, or does not pay it at all.

To conclude with a word or plan whereby unprofessional dentistry can be put down. This, you will admit, is a most difficult theme.

It has been said by a humorist of the last century that,

" Oftimes the pleasure is as great
Of being cheated as to cheat,"

and, while the world is constituted as it is,

it were useless to expect that quackery, in any department of life, can be extirpated. Yet something may be done, both to check it and counteract its evils. I would suggest—

1st. The highest possible standard of scientific attainment in our profession. To depreciate others we must appreciate ourselves. To exhibit quackery in its native hideousness to the world, we must remove ourselves as high as possible by professional acquirements from quackery, and make the space between us evident to the humblest mind. Were I at liberty to name

them, I could designate from those around me, individual cases that might serve as patterns in all that is earnest, zealous, and conscientious in dentistry.

2ndly. A careful avoidance of any of the unprofessional arts to which I have alluded, and a recurrence to the primitive model of our fathers. Whoever descends into the arena of popular competition will never rise to a dignified seat with the elders of our vocation.

3rd. Positive refusal to unite in consultation, or in any other manner associate with empirical practitioners.

Dental News and Critical Reports.

IMPORTANT HULL DENTIST CASE.

(From the 'Hull Packet and East Riding Times,' June 14th, 1861.)

In the Vice-Chancellor's Court, London, on Wednesday last, the case of Mosely v. Abel came on before Sir W. P. Wood.

Sir HUGH CAIRNS and Mr. CHARLES WOOD moved on behalf of the plaintiff for an injunction to restrain the defendant from practising the profession or business of a surgeon dentist, or any branch thereof, at Leeds, York, Harrogate, Wakefield, or Skipton, or at any place in or within ten miles of the town and county of the town of Kingston-upon-Hull, or the city or county of York, or the city or county of Lincoln. The question turned upon the meaning of the term "city and county of York," and arose under the following circumstances:—The plaintiff had for some years practised as a dentist in Yorkshire, being in the habit of visiting the various places throughout the county, either by himself or by his assistants and agents, his residence and head-quarters being at Hull. The defendant had been employed by the plaintiff as an assistant. In January, 1859, an agreement was executed between the plaintiff and defendant, by which the defendant covenanted to become an assistant to the plaintiff for five years, as from July, 1858, that he would not during that term, directly or indirectly, practise as a dentist, except for the benefit of the plaintiff, with other provisions not material. The agreement also contained a covenant by the defendant, that for seven years after the

determination of the agreement he would not, directly or indirectly, by himself or by any agent or assistant, or otherwise for the benefit of himself or any other person, practise or carry on the profession or business of dentist, or any branch thereof, "in or within ten miles of any of the several places and counties following:—viz., the town and county of the town of Kingston-upon-Hull, the city and county of York, the city and county of Lincoln, and the county of Stafford." A penalty of £100 per day was imposed upon the defendant as liquidated damages for breach of the agreement and its covenants. The agreement was determined by notice from the plaintiff, dated the 8th of February, 1861. The defendant had lately commenced practice as a dentist at Leeds and other places in Yorkshire, and had advertised in the local papers his arrangements for attending at Harrogate, Wakefield, and Skipton. The plaintiff filed his bill to restrain the defendant from practising at the places specified in the notice of motion and generally within Yorkshire. The bill also sought to enforce the penalties stipulated in the agreement in case of breach of covenant.

In support of the motion it was contended that the term "city and county of York," both in the popular and in the legal sense, included the whole of Yorkshire; and that there had been a clear breach of the agreement, and that there was ample jurisdiction in the Court for restraining such breach, while the agreement was not open to any objection such as to induce the Court to withhold relief.

Mr. ROLT and Mr. KAY, for the defen-

dant, contended that the term "city and county of York" applied to York itself and the precincts, and did not include all Yorkshire. The defendant swore to his belief that the term was intended in the limited sense in the agreement, and that on this belief the agreement was signed by him. They also contended that the agreement was harsh and unreasonable in its terms, and harshly acted upon, and that no relief could be granted upon it in equity. At any rate, the Court would construe it strictly against the person seeking to enforce it. By granting the injunction the public would be deprived of the defendant's assistance, while they could not possibly get the benefit of the plaintiff's services, one man being wholly insufficient for the care of the teeth of all Yorkshire.

Sir HUGH CAIRNS was heard in reply.

The VICE-CHANCELLOR said that there was no counter equity on the part of the defendant, nor could his notion of what was the effect of the expression used in the agreement be taken into account. He was entitled to have the question tried at law, and whatever might be the legal effect of the covenant, that must prevail. Looking at the words of the agreement, one would be led to conclude that all Yorkshire, and not merely the city of York, was included in the restriction. The words, however, were singularly placed, and there was a fair question to be tried. As to the extent of the area comprised in the covenant, it had been held that a covenant prohibiting a dentist from practising in all London or Westminster was not too extensive, as people would be attracted to a dentist of reputation from all parts of London, even from Mile-end. But the case as to an entire county was by no means so clear. It was not a parallel case to that of London, and it was not clear that people would come

to one particular dentist from all parts of a large county such as Yorkshire. Then, again, there might be doubts as to the plaintiff being able to supply the place of dentist for a whole county and ten miles beyond it. He was not favorably impressed with the defendant's course of proceeding, which was, no doubt, adopted for the express purpose of getting the plaintiff's customers; but the question was altogether one of legal right. Upon the balance of convenience and inconvenience, he thought that it would not be right to stop the defendant's practice *in limine*. The motion for an injunction would, therefore, stand over until the legal question had been tried, with liberty for either party to apply.

ROYAL COLLEGE OF SURGEONS.

The following gentlemen, having passed the necessary examinations, received their diplomas in dentistry at a meeting of the Board of Examiners on the 6th inst.:—William Barker, Crescent, New Bridge Street; Henry Budd, Turnham Green; John Swanston Cobb, Great Yarmouth; Edmund Durant, Winchester; Charles William Dunn, Florence.

The following gentleman, son of Mr. Byat West, Dentist, Old Broad Street, City, was admitted a Member of the Royal College of Surgeons on the 31st ult.:—John Thomas Henry West, Old Broad Street, City.

APPOINTMENTS.

Mr. Charles Bromley, L.D.S. of the Royal College of Surgeons, Eng., has been elected Dentist to the Royal South Hants Infirmary at Southampton.

Mr. John Brock has been appointed Dentist to the Westminster General Dispensary.

Mr. J. H. B. Thwaites has been appointed Dentist to the Bristol General Hospital.

The Month: Miscellanea and Scientific Intelligence.

CADMIUM.

In the course of an interesting paper on the metal cadmium, in the 'Journal of the Franklin Institute' for August, Dr. B. Wood, of Nashville, makes the following remarks on the properties of some of its alloys:—"As to the brittleness which cadmium is said to communicate when combined with any other metal, the facts are, *some* of its

alloys, even with malleable metals, are 'brittle.' But others are highly tenacious and malleable. Its alloys with gold, platinum, and copper, afford instances of the former. Its combinations with lead, tin, and to a certain extent with silver and mercury, are examples of the latter. An alloy of two parts silver and one of cadmium is perfectly malleable and very hard and strong; with equal parts of each it is also

malleable, but possesses less tenacity; but when mixed in the proportions of two parts of cadmium and one part of silver it is brittle. Equal parts of cadmium and mercury form a tough and highly malleable composition; in the proportion of two parts of the latter to one of the former, the amalgam is nearly equal in malleability, but possesses less strength. These mixtures are remarkable in view of the fact that most amalgams are exceedingly frail and brittle. A mixture of two or three parts of tin with one part of mercury is so fragile as almost to drop to pieces in handling; the amalgams with lead, bismuth, &c., are similar."—(*From the Dental Cosmos*, Sept., 1860.

DR. FISCHER states, in the 'Wiener Allgemeine Zeitung,' that vomiting after inhalations of chloroform may be prevented by making the patient take a glass of wine before the inhalations are commenced.

BOOKS RECEIVED.

'On the Time and Manner of Closure of the Auriculo-Ventricular Valves.' By George B. Hatford, M.D., M.R.C.P. Lond., Lecturer on Anatomy at the Grosvenor Place School of Medicine. London: John Churchill, New Burlington Street, 1860.

'Der Zahnarzt,' May and June, 1861.

'Dental Register of the West,' June and July, 1861.

To Correspondents.

NOTICE.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.
2. All communications relative to subscriptions and advertisements are to be addressed to the Publisher, Mr. John Churchill, 11, New Burlington Street, London, W.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. The Journal will be supplied direct from the Office on PREPAYMENT of subscriptions as under:

Twelve Months (post-free)	. . .	13s. 0d.
Six Months	"	6s. 6d.

Post-office Orders to be made payable, at the Regent Street Office, to John Churchill, 11, New Burlington Street, W. A single number sent on receipt of thirteen stamps.

"An Old Subscriber."—Mr. Parkinson, of Sackville Street, was the first recipient of the Dental Diploma of the Royal College of Surgeons of England.

"H. Pearce."—Thanks.

"Inquirer."—Thanks. Our notes crossed.

"Medicus" is thanked, but not having enclosed his card, we cannot publish his note. Is not the advertisement a very old one? A later one would be better.

Communications have been received from "Medicus;" P. K.; George Owen; John Chatto, Librarian to the Royal College of Surgeons; J. Hearder; C. Bromley, Southampton; H. Pearce; Le Neve Foster; "X.;" "Inquirer;" "An Old Subscriber;" B. West; and C. Spence Bate.

[ADVERTISEMENTS.]

A CARD.

G. W. RUTTERFORD, Importer of
G. American Teeth for Gum, Plate, and Vulcanite, and general Dental Materials. Osteoplastic and other Fillings. Agent for J. Faulkner's Dental Rubbers, orange and neutral-tinted colours, 16s. and 21s. per lb.
21, St. Thomas Street, St. Peter's, Islington, N.

MR. STENT'S NEW AND IMPROVED
PLASTIC COMPOSITION, for taking a perfect BITE, and the most accurate IMPRESSIONS, is used in a state as soft as wax, but becomes hard in the mouth in two or three months, so that an impression taken with it is always perfect, and is never dragged in withdrawing from the mouth. Sold at the Dépôt, in 2s., 4s., and 8s. Packets, with Directions.

NEW ANODYNE SILICA STOPPING,
An excellent filling for *front teeth* or cavities extremely *sensitive*; it is white, and can be coloured to match any tooth to prevent detection. Price 3s. 6d. per Packet, with Directions.

VULCANITE ENAMEL,
For covering the front part, and substituting for the natural gums pieces made of Vulcanite. The inventor challenges the whole profession to produce its equal, or a better for the purpose. Price 5s. per Packet, with Directions.

N.B.—Vulcanite Pieces Enamelled for the Profession, 2s. 6d. each.

22, COVENTRY STREET, HAYMARKET.

CONDY'S Patent Ozonized Water, for the
Bath and Toilet, removes impure and foreign tastes and odours from the mouth, strengthens the gums, is antiseptic, and is in a high degree adapted for purifying the mouth, for preserving the teeth, and for the immersion of artificial teeth. It purifies and softens the skin, allays irritation, removes secretions, stimulates and promotes the healthy action of the skin, and tends generally to the creation and preservation of a healthy state of the body. In stoppered bottles, 2s.; double size, 3s. 6d.

Wholesale Agents, J. BELL & Co., 332, Oxford Street, W.; P. SQUIRE, 277, Oxford Street, W.; and T. LEMALE and Co., 62, Chandos Street, W.C.

British Journal of Dental Science.

No. 63.

LONDON, SEPTEMBER, 1861.

VOL. IV.

Dental Surgery and Medicine.

ON THE TREATMENT OF ALVEOLAR ABSCESS.

By C. SPENCE BATE, F.R.S., F.L.S., &c.

(Continued from page 169.)

On the 25th of December, 1859, Miss S—, æt. 40, called, having severe toothache in a left upper lateral incisor. The gum was swelled corresponding with the extremity of the fang of the tooth, to which she herself had applied leeches, but without obtaining any relief. The tooth was one that I had stopped with a large gold plug six years previously. The stopping was firm, and she was very desirous not to lose the tooth. She had had two similar, but less severe, attacks previously; these had both succumbed to the loss of blood by leeches; but this time the pain was very severe. Her countenance denoted inexpressible agony. It commenced on the evening of the 24th. The weather at the time was extremely cold—colder than it had been for many years—frost and snow.

I applied chloroform to the gums, and then, with a drill, punctured the gum and alveolar walls to the extremity of the fang near the incipient abscess. The pain of the operation was stated to have been severe, but was reduced by the topical application of chloroform and tincture of aconite. Upon the subsidence of the pain from the operation, the patient was enabled to press the teeth against the lower ones, which she was unable to do previously to the operation, and the intense agony decreased to a pain that was bearable. The next morning she sent her servant to inform me that the pain continued to ameliorate.

Some time afterwards this lady called on me relative to another tooth, when she said that a few days after she was taken very unwell in health, and called in her medical attendant; that her face swelled again, but without great pain, and ultimately suppurated and got well.

Mr. C. B—, æt. 19, follows next. On the 27th of December, 1859, he called with a large swelling corresponding with the extremity of the fang of the right upper canine. The tooth has a large gold plug in it, which I put there about two years since. The stopping stands well. This patient is about nineteen years of age, and has every tooth in the upper jaw plugged, while those of the under jaw are, I believe, not decayed at all. The weather at this time was extremely cold (seven to fifteen degrees below freezing), which brought on pain in all the upper teeth.

I punctured through the gum and alveolar wall to the extremity of the fang. The operation was found to be painful, but relieved by chloroform. The pain gradually subsided, and the tooth has not pained since. I have had occasion recently to extract the first bicuspid, while the canine stands well.

The next case that I find in my notebook is that of Mrs. B—, æt. 40. She had a left upper lateral incisor which I filled for her some two or three years since. About a year ago she called, complaining of pain. The tooth was tender to the touch. I drilled through the gum to near the extremity of the fang of the tooth. The operation was pronounced to be very painful; but I saw no more of her

until the 3rd of January in this year, when she said that she had found relief, but that recently the tooth had pained again—pain with considerable throbbing. I suggested her taking some alterative medicine, and heard no more of the case.

In the early part of June last, Mr. B—, æt. 21, called with a swelling corresponding with the extremity of the left upper canine. I perforated as in the previous cases. The operation was stated not to have been painful; but the face swelled considerably the next two days, and ultimately subsided, there being little or no pain all through.

The next case that I have to put on record should, in point of date, precede the rest, inasmuch as it first induced me to puncture through the gum for alveolar abscess. This gentleman had a tooth then but recently plugged with cement. It was—I give it from memory—a left upper bicuspid. Hullihen had but recently announced his treatment of what has been called the Talicotian operation. Believing this to be a case particularly applicable for the operation, I determined to make my first essay. I operated by means of an Archimedian drill. The patient bore the operation until I reached the tooth, which, from the tenderness, was so acutely painful that he could not bear it to proceed; so I stopped short just at the surface of the fang. From that time the pain subsided; thus I thought that the cure *might* have been brought about by the perforation I then made. This induced me to treat the six or seven cases as I have described. Whether the result be sufficiently encouraging to induce others to experiment or not, I cannot tell; but it appears to me that the operation is worthy of consideration.

While writing upon perforating for alveolar abscess, it is not far from the question to mention my experience of Dr. Hullihen's operation. I think that it is only twice that I have so operated. The first was on a first under bicuspid, that I had some time before plugged posteriorly with cement. The tooth ached severely, and I drilled into the chamber of the pulp cavity, and a rush of pus followed the withdrawal of the drill. This tooth soon got well; but it has since been tender, and it was with difficulty that I could restrain the patient from having the tooth extracted. The second was the first left upper molar, that I had previously plugged with a large

mass of Ash's cement. I drilled into the pulp cavity, but no matter followed, and it was difficult to determine or not that the blood came out of the orifice or from the wounded gum. However, from this date the pain slackened, and then disappeared.

Some months after, and the same tooth pained so severely that the gentleman (a clergyman who had some duty to attend to) determined upon having the tooth extracted; this I did with some reluctance.

Upon examining the tooth after extraction, I found the drill had perforated into the chamber of the pulp cavity, which I also found to be full, or nearly so, of pus, which had not escaped through the small orifice that I had made.

It may be said that these two cases in the first instance were successful—at all events sufficiently so to induce one to try the experiment further; but I must confess that it is an operation that appears to me, to say the least, of doubtful surgery. To wound sound tissue, whilst there is already an opening through the decayed structure, appears to me to be altogether a work of supererogation; to say the most, it only spares the labour and pain of removing the stopping that is already inserted, and which, when well done, the operator has a reluctance to disturb. It certainly appears to me that the true treatment is to remove the plug and penetrate to the chamber of the pulp canal through the decayed cavity.

I remember when this subject was first broached, some twelve years since, that a writer in the 'Medical Times' stated that he had been successful, when teeth pained after having been plugged, by drilling a small orifice through the plug itself; while a second stated that it was always his rule to insert a tube in the centre of the plug, thus offering a ready and free passage for the exit of any matter that may collect within the cavity.

I do not think that either method has been much, if at all, followed; for I feel assured that it would very soon be looked upon as bad practice, inasmuch as it removes all the advantages that a tooth can be supposed to derive from being plugged, even should it not become choked by the entrance of food, and so preclude the fulfilment of the only object that it was intended to sustain.

**ON THE CLOSURE OF CLEFTS
IN THE HARD PALATE BY
OPERATION.**—By J. W. HULKE,
F.R.C.S., Assistant-Surgeon to King's
College Hospital, and to the Royal
London Ophthalmic Hospital.

(From the 'Med. Times and Gazette,'
Aug. 31st, 1861.)

In a letter from Berlin, published in the 'Medical Times and Gazette,' July 20, on "Uranoplastics," it is stated that Professor Langenbeck had exhibited, at a meeting of the Medical Society, "a boy in whom he had effected a cure of congenital total cleft of the hard and soft palate by a new operative proceeding;" and the correspondent adds, "A complete closing of this malformation has probably never yet been attained before."

This "new proceeding" has long been very successfully practised by English surgeons, more particularly by my colleague, Mr. Fergusson, and by Mr. G. Pollock, whose valuable contribution to the surgical treatment of this malformation was published in the 'Medico-Chirurgical Transactions' a few years since.

The following case, treated by me in 1859, though not completely successful, was sufficiently so to show that, had the patient submitted to another operation, complete union would have been obtained:

Total Congenital Cleft of the Hard and Soft Palates.—Richard B., aged 40, an artisan, was admitted into King's College Hospital on September 12, 1859, with a cleft palate. A corresponding fissure in the upper lip had been closed by an operation in childhood. The soft and hard palate were both split. The cleft in the hard palate encroached rather more on the left than on the right of the middle line. It was about half an inch across at its widest, and narrowed anteriorly till opposite the first bicuspid tooth, from which point it ran outwards as a linear fissure, through the alveolus, between the right lateral incisor and canine teeth. The roof of the mouth was lofty, and its sides were inclined towards each other at an acute angle. The vomer was deficient. The mucous membrane of the pharynx had the usual dry appearance; the trumpet mouths of the Eustachian tubes were conspicuous. The voice was very weak, and scarcely intelligible. After the sensitive-

ness of the fauces had been blunted by tickling them for a few days with a feather.

On September 17, I closed the gap in the soft palate by Mr. Fergusson's method of operating, putting in five silver stitches. Two of these were removed on the 21st, and the other three on the 24th, when the whole length of the wound had united.

October 1.—He went into the country; his voice was but slightly improved.

December 29.—Returned to the hospital. His articulation was more distinct, and voice so much stronger that he could join in the singing in the chapel.

January 7.—I incised the edge of the cleft in the hard palate with a small Fergusson's knife; and then working in the cut with a stronger Pollock's knife, detached the mucous membrane and periosteum on each side, as far as the alveolar process, working from the front backwards, in order to cut the larger branches of the posterior palatine artery last. The flaps of mucous membrane and periosteum obtained in this way fell together in the middle line without any dragging, their edges even slightly overlapped. Three silver stitches were used; the posterior cut out on the third day (owing to the darkness of the afternoon I was not satisfied I had put it in accurately); the anterior was removed on the fourteenth, and the middle one on the sixteenth day, at which time the wound had united everywhere, excepting at the junction of the hard and soft palates, where there was still a small hole corresponding to the posterior stitch, of the diameter of a small cedar pencil. This I intended to close after an interval of a few weeks, and I believe there would have been no difficulty in doing it; but the patient, who had returned to his employment in Yorkshire, could not get leave of absence. He wrote to tell me of the great improvement in his voice, and to express his gratitude.

The separation of the mucous membrane with the periosteum of the hard palate from the bone is always attended with free bleeding; but though so many vessels are necessarily divided, yet the flaps are amply nourished through the continuity of their attached borders with the gum. It is probable that the flaps do not perish from want of blood, but that their gangrene, which has deterred so many surgeons from prosecuting further attempts to close clefts in the hard palate, is favoured by the use of blunt levers and raspatories, by which the tissues are

bruised and injured much more than when they are more cleanly cut away with a sharp knife, the edge of which is kept against the bone; by the dragging of the flaps by the stitches when they have been insufficiently separated from the bone; and by the restriction of the patient to a very low and insufficient diet, as is too generally enforced, instead of a liberal supply of nourishment after the operation. The free supply of blood which the denuded bone receives from the periosteum clothing its upper surface prevents its necrosis.

Total clefts of the hard palate running out through the alveolar process anteriorly, are more favorable for operative treatment than lesser clefts involving the posterior part of the hard palate only; because in total cleft, the roof of the mouth is lofty, and larger flaps can be gained than in partial, posterior cleft, where the palatine arch approaches more closely the natural curve.

10, Old Burlington Street.

ON THE MODES OF DEATH FROM CHLOROFORM. By A. ERNEST SAN- SON, M.B. Lond., F.C.S.

(From the 'Lancet,' Aug. 24th, 1861.)

OF all the physiological questions to which the employment of chloroform has given rise, none has received such contradictory answers—none has elicited such active discussion, as the nature of the death of those in whom the anæsthetic has proved fatal. Faults of inference, or faults of observation, have been imputed to almost all who have investigated the question; and to all intents and purposes the point remains unsettled. Whether is death due to syncope or to apnœa; to paralysis of circulation or of respiration; or may either be the cause of death? My conviction is, that either may be; but that a tolerably definite law is followed, which I shall here endeavour to establish.

Dr. Snow held that in all cases the heart was the first to succumb to the influence of chloroform. Lallemand, Perrin, and Duroy, and the late writers on anæsthetics, declare that circulation outlives all the other vital functions. Taking a wide basis for observation, I believe that these discrepancies can be reconciled. The first great axiom is, that the system is traversed by an imper-

fectly vitalised blood; the problem is, to determine what organs of the system the impure blood first fails to stimulate.

The heart of different animals responds to stimuli in different degrees. In different classes of animals there is a different automatic contractile power of the heart; and it seems logical to infer that circumstances tending to destroy the contractile power should operate unequally in the different classes. It is well known that the heart of reptiles will continue to contract rhythmically long after death. Not only so, but if the heart be removed from the body, the systole and diastole will persist so long as there is moisture sufficient to allow of them, and if, after they have ceased from this cause, the organ be again moistened, the movements will be resumed. There seems to be scarcely any limit to the automatic power here. In birds and certain mammals Remak observed certain rhythmic movements of the heart two days after death. In man such movements were observed by Harless an hour after decapitation; but the longest period during which they were observed to continue was twenty-seven hours, as recorded by Emile Rousseau. There is, therefore, a wide difference in the persistence of the heart's action in reptiles, in birds and mammals, and in man. So, also, is there a difference in the resisting power of the hearts of various animals. If the heart of a frog be detached from the body, and placed in liquid chloroform, its contractions will continue as though it were merely exposed to the air. It is even said that they may continue longer under the one circumstance than under the other.* On the other hand, if a dog's heart, still contracting, be plunged into liquid chloroform, all movement instantly ceases. Dr. Snow said, that directing a stream of chloroform vapour upon an animal's heart instantly paralysed it; but though I have always seen this effect produced at the time, I have noticed in the case of guinea-pigs a resumption of rhythmical contractions after the lapse of some time. It is, therefore, abundantly proved, that the hearts of different animals resist the influence of chloroform in different degrees.

In animals caused to inhale chloroform, the heart, in almost all instances, is the "*ultimum moriens*." The duration of the persistence of the movements of circulation over those of respiration varies, according to MM. Lallemand, Perrin, and Duroy,

* 'Gazette Médicale de Paris,' 1853, t. viii, p. 436.

from a few seconds to three minutes. One instance is recorded in which the duration was six minutes.

The next question is, whether in man there is a similar survival of the heart-pulsations. To investigate it many things have to be considered; and first, the manner in which the signs of danger have first manifested themselves. Looking over fifty-one recorded cases of death from chloroform, I find that thirty-eight first declared their danger by the fact of the sudden stoppage of the pulse. Twenty-five of these showed, in addition, as a chief sign, extreme pallor of the countenance. Congestion of the face is mentioned as the most marked symptom in six cases, and cessation of the breathing in eight. In by far the greater number of cases, therefore, the signs are not reconcilable with a state of danger from suffocation; there is pallor of the countenance instead of suffusion, and cessation of the pulse before cessation of the respiration. In a few cases,* however, I believe that death has occurred by suffocation. In one of these, occurring at Gros Caillou, the symptoms were sudden embarrassment of respiration and sudden dilatation of the pupils. At the post-mortem examination the lungs were found to be studded with tubercles and gorged with blood. The universal opinion was that death was due to asphyxia.† In the case of the death of a soldier during the Crimean campaign, it is stated that the respiration ceased before the pulse.‡ These facts are, I think, sufficient to show that there is not a complete similarity between the death of man from chloroform and the death of the inferior animals from chloroform.

So also the records of post-mortem examinations show that a perfect parallel does not obtain. In animals the following are briefly the appearances:—*Lungs*, when the autopsy is made shortly after death, of a rose colour, presenting neither ecchymoses, nor emphysema; when the autopsy is deferred, there is hypostatic congestion. *Heart*—Right cavities and large veins filled with dark, very fluid blood; left cavities generally empty, but sometimes containing a small clot. *Brain and nervous system* appear to be normal.

The cause of the distension of the right chambers of the heart with dark and fluid blood is conceived by MM. Lallemand,

* Four out of fifty-one.

† 'Gaz. des Hôpitaux,' 1858, No. 69.

‡ Macleod, 'Surgery of War in Crimea,' ch. vi.

Perrin, and Duroy to be this—that the blood is imperfectly arterialized by the arrest of respiration, and the heart continues to contract after the arrest. Abrogation of the motor influence on respiration is considered by them to be the primary cause of death.

Turning to the records of post-mortem examinations which have been made on the human subject, it will be seen that the same uniformity does not obtain; that distension of the right cavities of the heart is by no means a constant sign. I have here grouped the principal appearances of forty-six cases, in which post-mortem examinations have been made with sufficient care.

LUNGS.

Congested	19
Congested in lower portions	3
Natural	7

BRAIN.

Natural	10
Congested	8
Slightly congested	1
Medulla oblongata and cerebellum congested	1
Dura mater congested	5
Pale	5
Upper surface pale	1

HEART.

Right side distended with fluid blood	10
All cavities containing blood, especially right	7
All cavities filled with blood	3
Right side containing air or frothy blood	2
Small clots in right cavities; left empty	2
Each ventricle containing blood	2
Cavities containing air, but little blood	1
All cavities empty	8
All cavities almost empty	1

From this it follows that it is almost as common to find the right side of the heart empty as it is to find it filled with blood. Taking this fact with the fact that the heart in the cases fatal to man is the first to fail, it seems abundantly proven that the laws which govern the death of animals from chloroform do not in similar force govern the death of man.

In the four cases which I have mentioned, wherein death probably resulted from asphyxia, there were both distension of the right cavities of the heart and engorgement of the lungs. The cause of death would operate here either centrally or peripherally. Centrally probably in most—namely, undue depression of the functions of the central nerve-mass presiding over the movements

of respiration. Peripherally in at least one case recorded by M. Faure in the 'Union Médicale,' in which there were *congestion* and ecchymoses of both lungs. The action here was local; the stasis of the blood was primarily in the lung itself. The remaining deaths divide themselves into two classes—First, those in which the heart first stopped, and in which the right side was found full. Secondly, those in which, also, it first failed, but the right side was found empty. In both these, death must be said to result from *palsy of the heart*—a palsy either cerebral or cardiac; cardiac when the impure blood affords to the heart an insufficient excitator influence; cerebral when it affords to the brain an insufficient motor influence.

The conclusions from the foregoing facts appear to me to be these—It is not just to say, that because animals never die of syncope, man never dies in like manner. All the vital functions in etherization are depressed by an altered blood. What link is first snapped asunder in fatal cases is determined by various causes. In animals respiration fails first because the automatic power of their hearts enables its movements to persist. In man, circulation usually first fails because the heart is the most susceptible of the incomplete stimulus. In animals death occurs by asphyxia, and death begins in the brain. In man death occurs of syncope or by asphyxia, and death begins in the brain, in the heart, or in the lungs. Practical men may learn a useful caution from this; for it has been said, that in cases of danger the pulse is to be disregarded, and the embarrassment of the breathing taken as the critical sign. If I may be permitted to express dogmatically what I have learnt by experience, I would say,—Rely, almost wholly, on the pulse. Disregard dyspnoea if the pulse be good; but if the pulse show signs of failing, withdraw the chloroform, and consider the condition a condition of danger.

Brook Street, Hanover Square;
Aug., 1861.

ON OSTEO-PLASTIC RESECTION OF THE UPPER JAW.

(From the 'Medical Times and Gazette,'
Sept. 7th, 1861.)

THIS operation consists in separating the upper jaw from its connections with other bones, and again restoring it to its normal position. An operation of a similar kind

was first done by Professor Langenbeck, two years ago, when he extirpated a nasopharyngeal polypus; in that case he excised the nasal bone and the nasal process of the upper jaw, removed the tumour, and afterwards replaced the bones, with complete success. Another case in which the whole half of the upper jaw was first excised and then replaced, occurred in the practice of this distinguished surgeon a few weeks ago.

The seat of nasopharyngeal polypi is such as to require the resection of one-half of the upper jaw, and this has been done repeatedly, in France especially, by Messrs. Robert and Maisonneuve. In the cases which occurred in Professor Langenbeck's practice, he had always been able to perform extraction either from the mouth or the nostrils, or by division of the soft palate, and resection of the horizontal part of the os palatinum, or the resection of the nasal process of the upper jaw. He was therefore averse to the extirpation of the upper jaw, especially as experience has shown that a recurrence of the tumour is not prevented thereby. There are, however, tumours, which are attached in the neighbourhood of the Eustachian tube, and the foramen sphenopalatinum, and the sinus sphenoidalis, which cannot be completely removed unless the upper jaw is taken away. Besides, tumours are now and then observed in the fossa pterygo-palatina, which grow partly towards the nasopharyngeal cavity, partly towards the fossa sphenomaxillaris, so that the upper jaw is quite surrounded by them, and must necessarily be removed before the surgeon can attempt extirpating the tumour. Professor Langenbeck, however, satisfied himself, by a close examination of the skull, that the region just described, would become quite accessible by only removing the upper part of the jaw, without taking away the hard and soft palate and the alveolar process. Having been struck by this idea, he conceived that it might be possible to replace the upper jaw after the operation, just as he had succeeded in doing before with the nasal bone and the nasal process of the jaw. It was, of course, necessary to avoid the destruction of the soft coverings of the jaw, the skin of the face, the mucous membrane, and the periosteum of any part of the bone; and it was obvious that, on one point at least, it ought to remain attached to the neighbouring bones, in order to allow a sufficient supply of blood. These conditions he purposed to fulfil, by not separating the soft

parts of the face from the bone, but merely cutting them through down to the bone, in the same direction in which the saw would have to work, and by leaving the nasal process of the upper jaw in contact with the nasal bone, and the nasal process of the frontal bone.

The following are a few particulars of the case in which this operation was first performed, with successful results :

The patient, a boy, *æt.* 15, had always been healthy until two years ago when he perceived a want of air in the left nostril, which soon became perfectly impermeable, the voice being changed at the same time.

About seven weeks ago, the left cheek and eye began to protrude, and the latter, although otherwise healthy, was no longer used for seeing. No tumour was visible from the nostril, nor from the mouth, while in the middle of the left palatine process of the upper jaw the floor of the cavity of the nose appeared to be pressed toward the cavity of the mouth, and this part felt soft and elastic on account of the dislodgement of the palatine bone. Behind the soft palate a firm, lobular tumour could be felt in the left choana, which was quite filled up by it, the introitus into the left side of the nose being blocked up. This latter space appeared to be considerably enlarged, while the right choana and nostril were narrowed. The osseous septum narium was dislodged towards the right side. The teeth in the left upper jaw were quite healthy and fast. The slight prominence of the left cheek was caused by a tumour between the masseter muscle and the upper jaw. The left zygomatic arch was a little more prominent, and the lower part of the left fossa temporalis fuller than is commonly the case. Nothing morbid could be discovered in the orbit.

Other surgeons who had seen this patient contended that it was a case of naso-pharyngeal polypus ; but Professor Langenbeck argued against this opinion, that all tumours which are not cancerous, as, for instance, the polypi, grow in that direction in which the least resistance is offered by surrounding parts ; and that therefore a naso-pharyngeal polypus would grow into the sinus frontalis, sphenoidalis, and maxillaris, and the labyrinth of the ethmoid bone, and might distend the walls of those cavities, but that it could not grow from the naso-pharyngeal cavity into the fossa pterygo-palatina, and round the upper jaw forwards. Others thought

that a tumour in Highmor's cavity existed ; but to this M. Langenbeck objected that the walls of that cavity were no where projecting, but on the contrary, its external wall was decidedly flattened. He therefore, before performing the operation, mentioned that the case was one of a fibroid of the fossa pterygo-palatina, which had grown from there through the foramen sphenopalatinum into the naso-pharyngeal cavity, the fossa sphenomaxillaris, and round the upper jaw between its external wall and the masseter muscle towards the mucous membrane of the cheek. He also said that the resection of the zygomatic arch, which he had done in a previous case, was sufficient for the extirpation of tumours which grew from the fossa pterygo-palatina into the fossa sphenomaxillaris and temporalis ; but that, in this patient, in whom the tumour had penetrated from the fossa pterygo-palatina into the naso-pharyngeal cavity, the resection of the entire left half of the upper jaw was absolutely necessary. In order to avoid mutilation of the face, he intended trying to replace the upper jaw after the removal of the growth.

The operation was done on July 1, the patient being under the influence of chloroform. Two incisions were then made through the skin, the lower one of these from the place of insertion of the left alar nasi in the cheek, and through this towards the lower edge of the zygomatic arch, and along this bone to the middle of the zygomatic process of the temporal bone. The upper incision proceeded from the nasal process of the frontal bone along the lower edge of the orbit, and beyond the frontal process of the upper jaw to the middle of the zygomatic process of the temporal bone, where it met the lower incision in an obtuse angle. Without separating the skin from the soft parts below it, the operator then penetrated through the lower incision towards the jaw, cut through its periosteum, and separated the masseter muscle from the lower edge of the zygomatic bone. After the fascia buccalis, which was strongly prominent, had been cut through, a lobular, white, shining tumour became visible, which extended between the external surface of the upper jaw and the coronoid process of the lower jaw, towards the fossa sphenomaxillaris backwards. After the lower jaw had been separated from the upper one by means of a speculum, the tumour could without difficulty be removed from the upper jaw, and the left forefinger proceeding between the upper jaw and the tumour, could

reach the fossa pterygo-palatina. As the upper jaw had been compressed by the tumour, and the fossæ speno-maxillaris and pterygo-palatina were considerably enlarged, a slight pressure was now sufficient to allow the introduction of a fine elevator into the pharyngeal cavity. A fine and straight narrow saw was then introduced from without into the pharyngeal cavity, through the fossa pterygo-palatina, and the foramen speno-palatinum; and the operator sawed through the whole upper jaw, from behind forwards, with a horizontal cut, while the left forefinger, which had been introduced into the pharyngeal cavity from the mouth, caught the point of the saw and prevented its touching the septum narium. The second incision through the skin was then likewise made down to the bone; the operator penetrated into the orbit and cut the soft parts in the angle between the frontal and temporal processes of the zygomatic bone. The second cut of the saw went from below upwards through the zygomatic process of the temporal bone, and through the orbital process of the upper jaw to the lachrymal bone. The resected jaw was now only connected with the left lachrymal bone and the nasal process of the frontal bone, by means of its nasal process, which had not been divided; and in this part the skin had also been left entire in order to allow nutrition to go on. Neither were the hard palate and the alveolar process of the jaw touched. The jaw was now raised by means of an elevator, introduced below the zygomatic bone. This was done without any difficulty, the jaw moving easily in the connexion with the left nasal bone and the nasal process of the temporal bone, as if it were in a joint, and was raised like the lid of a snuff box, so that the zygomatic bone was nearly on the median line of the face; and the fossæ speno-maxillaris, and pterygo-palatina, and the naso-pharyngeal cavity had thus become easily accessible. The peduncle of the tumour was now seen to be attached in the fossæ pterygo-palatina, proceeding from there towards each side; it was as large as a fowl's egg, and one part filled the naso-pharyngeal cavity, the other the fossa speno-maxillaris. The antrum Highmori, which had been opened by the horizontal cut of the saw at its inferior point, was empty and quite normal, although somewhat narrowed by the pressure of the tumour from behind and without. The peduncle of the

tumour was then separated by means of a broad elevator from the fossa pterygo-palatina; the part, which was in the cavity of the pharynx, was then caught with a strong polypus forceps, and drawn out. The foramen speno-palatinum and the fossa pterygo-palatina were enlarged to three times their normal size. The tumour was then entirely removed; and nowhere could a perforation of the basis cranii be discovered.

The hæmorrhage during the operation was very considerable, on account of the dilatation of the arteries; but at the end it ceased spontaneously. Only the arteria speno-palatina was tied at its entrance in the foramen speno-palatinum, and the ligature conducted through the left nostril. After the wound had been most carefully cleaned, and the operator had again satisfied himself that nothing was left behind, the jaw was again pressed backwards into its normal position, and the places where it had been sawed brought into contact. The jaw showed a disposition to swing upwards to the nose, so that a slight pressure had to be exercised upon it before the wound was entirely united by means of iron sutures. Some cerate and a thick layer of charpie was then placed upon the wound, and fixed by a bandage. The operation had lasted nearly an hour. Much chloroform had been used, and the little patient had shown some excitement during the intervals of insensibility.

The further course of this case was very satisfactory. There was at first some fever and suppuration; but in a little more than a fortnight the wound was quite healed. The appearance of the face was then nearly normal. The upper gum had quite regained its usual position, and there was no swelling of the soft parts; only the conjunctiva palpebrarum was a little puffed, but the eye did no longer protrude. There was imperfect palsy of the orbicularis muscle, and the eyelids could not be quite closed. Besides, the infra-orbital nerve and the ganglion speno-palatinum had been destroyed by the operation, so that there is, of course, anaesthesia of the parts animated by them. In all other respects it was a perfect cure; and it appears, therefore, that henceforward it is no longer allowed to remove the upper jaw in cases of this kind. We may well congratulate M. Langenbeck for having successfully completed—not only a novel operation of importance—no of the nicest and most difficult on record.

Mechanical Dentistry.

ON HARDENING AND TEMPERING STEEL.

(Continued from page 206.)

SECTION III.—Common examples of hardening and tempering steel.

Watchmakers' drills of the smallest kinds are heated in the blue part of the flame of the candle; larger drills are heated with the blow-pipe flame, applied very obliquely, and a little below the point; when very thin they may be whisked in the air to cool them, but they are more generally thrust into the tallow of the candle or the oil of the lamp; they are tempered either by their own heat, or by immersion in the flame below the point of the tool.

For tools between those suited to the action of the blowpipe, and those proper for the open fire, there are many which require either the iron tube, or the bath of lead or charcoal previously described, but the greater number of works are hardened in the ordinary smith's fire, without such defences.

Tools of moderate size, such as the majority of turning tools, carpenter's chisels and gouges, and so forth, are generally heated in the open fire; they require to be continually drawn backwards and forwards through the fire, to equalise the temperature applied; they are plunged vertically into the water and then moved about sideways to expose them to the cooler portions of the fluid. If needful, they are only dipped to a certain depth, the remainder being left soft.

Some persons use a shallow vessel filled only to the height of the portion to be hardened, and plunge the tools to the bottom; but this strict line of demarcation is sometimes dangerous, as the tools are apt to become cracked at the part, and therefore a small vertical movement is also generally given, that the transition from the hard to the soft part may occupy more length.

Razors and penknives are too frequently hardened without the removal of the scale arising from the forging; *this practice, which is not done with the best*

works, cannot be too much deprecated. The blades are heated in a coke or charcoal fire, and dipped into the water obliquely. In tempering razors, they are laid on their backs upon a clear fire, about half a dozen together, and they are removed one at a time, when the edges, which are yet thick, come down to a pale straw colour; should the backs accidentally get heated beyond the straw colour, the blades are cooled in water, but not otherwise. Penknife blades are tempered, a dozen or two at a time, on a plate of iron or copper about twelve inches long, three or four wide, and about a quarter of an inch thick; the blades are arranged close together on their backs, and lean at an angle against each other. As they come down to the temper, they are picked out with small pliers and thrown into water, if necessary; other blades are then thrust forward from the cooler parts of the plate to take their place.

Hatchets, adzes, cold chisels, and numbers of similar tools, in which the total bulk is considerable compared with the part to be hardened, are only partially dipped; they are afterwards let down by the heat of the remainder of the tool, and when the colour indicative of the temper is attained, they are entirely quenched. With the view of removing the loose scales, or the oxidation acquired in the fire, some workmen rub the objects hastily in dry salt before plunging them in the water, in order to give them a cleaner and whiter face.

In hardening large dies, anvils, and other pieces of considerable size, by direct immersion, the rapid formation of steam at the sides of the metal prevents the free access of the water for the removal of the heat with the required expedition; in these cases a copious stream of water from a reservoir above is allowed to fall on the surface to be hardened. This contrivance is frequently called a "float," and although the derivation of the name is not very clear, the practice is excellent, as it supplies an abundance of cold water; and which, as it falls directly on the centre of the anvil, is sure to render that part hard. It is, however, rather dangerous to stand near such works at the

time, as when the anvil face is not perfectly welded, it sometimes in part flies off with great violence and a loud report.

Occasionally the object is partly immersed in a tank beneath the fall of water, by means of a crane and slings; it is ultimately tempered with its own heat, and dropped in the water to become entirely cold.

Oil, or various mixtures of oil, tallow, wax and resin, are used for many thin and elastic objects, such as needles, fish-hooks, steel pens and springs, which require a milder degree of hardness than is given by water.

For example; steel pens are heated in large quantities in iron trays within a furnace, and are then hardened in an oily mixture; generally they are likewise tempered in oil, or a composition the boiling point of which is the same as the temperature suited to letting them down. This mode is particularly expeditious, as the temper cannot fall below the assigned degree. The dry heat of an oven is also used, and both the oil and oven may be made to serve for tempers harder than that given by boiling oil; but more care and observation are required for these lower temperatures.

Saws and springs are generally hardened in various compositions of oil, suet, wax, and other ingredients,* which, however, lose their hardening property after a few weeks' constant use; the saws are

* The composition used by an experienced saw-maker is two pounds of suet and a quarter of a pound of bees'-wax to every gallon of whale-oil; these are boiled together, and will serve for thin works and most kinds of steel. The addition of black resin, to the extent of about one pound to the gallon, makes it serve for thicker pieces and for those it refused to harden before; but the resin should be added with judgment, or the works will become too hard and brittle. The composition is useless when it has been constantly employed for about a month; the period depends, however, on the extent to which it is used, and the trough should be thoroughly cleaned out before new mixture is placed in it.

The following recipe is recommended by Mr. Gill:

"Twenty gallons of spermaceti oil;
Twenty pounds of beef suet rendered;
One gallon of neat-foot oil;
One pound of pitch;
Three pounds of black resin."

"These last two articles must be previously melted together, and then added to the other ingredients; when the whole must be heated in a proper iron vessel, with a close cover fitted to it, until the moisture is entirely evaporated, and the compo-

heated in long furnaces, and then immersed horizontally and edgewise in a long trough containing the composition; two troughs are commonly used, the one until it gets too warm, then the other for a period, and so on alternately. Part of the composition is wiped off the saws with a piece of leather, when they are removed from the trough, and they are heated one by one over a clear coke fire, until the grease inflames; this is called "*blazing off*." When the saws are wanted to be rather hard, but little of the grease is burned off; when milder, a larger portion; and for a spring temper, the whole is allowed to burn away. When the work is thick, or irregularly thick and thin, as in some springs, a second and third dose is burned off, to ensure equality of temper at all parts alike.*

Springs and saws appear to lose their elasticity, after hardening and tempering, from the reduction and friction they undergo in grinding and polishing. Towards the conclusion of the manufacture, the elasticity of the saw is restored principally by hammering, and partly by heating it over a clear coke fire to a straw colour; the tint is removed by very diluted muriatic acid; after which the saws are well washed in plain water and dried.

Watch springs are hammered out of round steel wire, of suitable diameter, until they fill the gauge for width, which at the same time ensures equality of thickness: the holes are punched in their extremities, and they are trimmed on the edge with a smooth file; the springs are then tied up with binding wire in a loose *open* coil, and heated over a charcoal fire upon a perforated revolving plate; they are hardened in oil, and blazed off.

The spring is now distended in a long metal frame, similar to that used for a saw-blade, and ground and polished with emery and oil, between lead blocks; by this time its elasticity appears quite lost, and it may be bent in any direction; its elasticity is, however, entirely restored by a subsequent hammering on a very bright

sition will take fire on a flaming body being presented to its surface, but which must be instantly extinguished again by putting on the cover of the vessel."—*Manufactures in Metal*, vol. i, p. 336; *Lardner's Cyclopædia*. See also page 311, *ibid*.

* Gun-lock springs are sometimes literally *fried in oil* for a considerable time over a fire in an iron tray; the thick parts are then sure to be sufficiently reduced, and the thin parts do not become the more softened from the continuance of the blazing heat.

anvil, which "*puts the nature into the spring.*"

The colouring is done over a flat plate of iron, or hood, under which a little spirit lamp is kept burning; the spring is continually drawn backwards and forwards, about two or three inches at a time, until it assumes the orange or deep blue tint throughout, according to the taste of the purchaser; by many the colouring is considered to be a matter of ornament, and not essential. The last process is to coil the spring into the spiral form, that it may enter the barrel in which it is to be contained; this is done by a tool, with a small axis and winch handle, and does not require heat.

The balance-springs of marine chronometers, which are in the form of a screw, are wound into the square thread of a screw of the appropriate diameter and coarseness; the two ends of the spring are retained by side screws, and the whole is carefully enveloped in platinum foil, and tightly bound with wire. The mass is next heated in a piece of gun-barrel closed at the one end, and plunged into oil, which hardens the spring almost without discolouring it, owing to the exclusion of the air by the close platinum covering, which is now removed, and the spring is let down to the blue, before removal from the screwed block.

The balance or hair-springs of common watches are frequently left soft; those of the best watches are hardened in the coil upon the plain cylinder, and are then curled into the spiral form between the edge of a blunt knife and the thumb, the same as in curling up a narrow riband of paper, or the filaments of an ostrich feather.

Mr. Dent says that 3200 balance-springs weigh only one ounce;* but springs also include the heaviest examples of hardened steel works uncombined with iron: for example, of Mr. Adams' patent bow-springs for all kinds of vehicles, some intended for railway use measure three and a half feet long, and weigh fifty pounds each piece; two of these are used in combination; other single springs are six feet long, and weigh seventy pounds.†

* The soft springs are worth 2s. 6d. each; the hardened and tempered springs, 10s. 6d. each. This raises the value of the steel, originally less than 2d., to £400 and £1600 respectively.—Mr. Dent's 'Lectures on Time-pieces, &c.'

† The principle of these bow springs will be immediately seen by conceiving the common archery bow fixed horizontally with its cord upwards; the

In hardening them they are heated by being drawn backwards and forwards through an ordinary forge fire, built hollow, and they are immersed in a trough of plain water; in tempering them they are heated until the black red is just visible at night; by daylight the heat is denoted by its making a piece of wood sparkle when rubbed on the spring, which is then allowed to cool in the air. The metal is nine sixteenths of an inch thick, and Mr. Adams considers five eighths the limit to which steel will harden properly, that is sufficiently alike to serve as a spring; he tests their elasticity far beyond their intended range.*

DENTAL PATENTS.

BY GEORGE OWEN.

(Continued from page 209.)

1846. Henry Valentine Bartlett.—For improvements in artificial palates, teeth, and gums, and certain machinery employed in the manufacture thereof.

ABSTRACT OF SPECIFICATION.

"In making artificial palates, teeth, and gums, I dispense with all pins, rivets, springs, and ligatures, and avoid also entirely the use of metallic

body of the carriage, been attached to the cord, sways both perpendicularly and sideways with perfect freedom.

* Great diversity of opinion exists respecting the cause of elasticity in springs; by some it is referred to different states of electricity; by others the elasticity is considered to reside in the thin, blue, oxidized surface, the removal of which is thought to destroy the elasticity, much in the same manner that the elasticity of a cane is greatly lost by stripping off its siliceous rind. The elasticity of a thick spring is certainly much impaired by grinding off a small quantity of its exterior metal, which is harder than the inner portion; and perhaps thin springs sustain in the polishing a proportional loss, which is to them equally fatal.

Mr. Dent stated, at the British Association, 1841, that he found experimentally the bare removal of the blue tint from a pendulum spring, by its immersion in weak acid, caused the chronometer to lose nearly one minute each hour; a second and equal immersion scarcely caused any further loss. He also stated it as a well-known fact, that such springs get stronger, in a minute degree, during the first two or three years they are in use, from some atmospheric change; when the springs are coated with gold by the electrotype process, no such change is observable, and the covering, although perfect, may be so thin as not to compensate for the loss of the blue oxidized surface.

substances. I prefer using the ivory of the hippopotamus, commonly known in commerce as African ivory. It is exceedingly durable, not perceptibly affected by the gastric juice or by acids, and preserves its original colour for a long time unimpaired. But where cheapness is an object, I employ the ivory of the walrus or sperm whale, or any of the other inferior sorts. I first make a cast of the mouth or part of the mouth which is to be fitted with the artificial substitute in the softened beeswax commonly used in casting. From this cast I take an impression in reverse in plaster of Paris, and from that reverse impression or mould I take another in relief in some plastic material which softens and hardens readily, such as shellac or gutta percha, which last impression is of course an exact counterpart of the original. I then carve out of a piece of ivory, of the particular sort before mentioned, an exact fac simile of the model so obtained, which shows the parts in which any new teeth required must be inserted, and indicates also the forms to be given to these teeth and to the holes in which they are to be inserted. And I employ for these purposes machinery of the description represented in the drawings hereunto annexed."

The description following the above quotation is of an apparatus to the bed of which the ivory is fixed by screws; an upright frame carries a stock to hold one or other of a series of annular, rose, pointed, square, round, or eccentric drills of various sizes, revolving in a horizontal plane. How the drills are made to cut so as to produce the necessary adaptation of the piece to the model is not stated, nor is it easy to conjecture this from the drawings and description. No model is in any way connected with the machine, to govern the action of the drills. Expired May 15th, 1860.

1846. William Henry Moggridge.—For certain improvements in the plates or pieces for the roof and gums of the mouth, for attaching thereto artificial teeth.

ABSTRACT OF SPECIFICATION.

"My said invention consists—

"Firstly, of an improvement in the shape or form of the plates or pieces of metal or other suitable material, to be fitted to the roof or gums of the mouth for attaching thereto artificial teeth; and secondly, of an improved mode of taking casts of the roof or gums of the mouth for the purpose of fitting thereto such plates or pieces as aforesaid.

"And, firstly, my improvement in the form or shape of plates or pieces for carrying artificial teeth consists in constructing such plates or pieces of such form or shape that the surfaces of the plates or pieces which are to come in contact with the roof or gums of the mouth shall press more strongly upon the roof or gums at or near to the edges of such pieces than in the centre or middle parts of such surfaces, so that, when the roof or gums come in contact with and are pressed upon such surfaces, the air may be excluded, and the

pressure of the atmosphere may cause the plates or pieces which carry artificial teeth to adhere more firmly to the roof or gums. In order to do this, if the plate or piece is intended to fit the roof of the mouth, the centre or middle part of the surface which is to come in contact with the roof must be made to project rather less than the opposite hollow in the roof of the mouth recedes, and thus, when the plate or piece is pressed upon the soft roof, the air will be excluded, and the pressure of the atmosphere upon the plate or piece will cause it to adhere and the close contact of the plate or piece at the edges will prevent the intrusion of the air. So, if the plate or piece is intended to fit the gums, the centre or middle part of the surface which is to come in contact with the gums must be made somewhat deeper than the projecting parts of the gums, which are to come in contact with such surface; by which means the same result will be produced and the plate be caused to adhere more firmly to the gums. To the plates thus constructed the teeth are to be riveted or fixed in the usual way, or the teeth and piece (when a metal plate is not used) may be made all in one if thought more desirable.

"And, secondly, my improved mode of taking casts of the roof or gums of the mouth, for the purpose of fitting thereto such plates or pieces as aforesaid, consists in admitting air between the surface of a wax mould and the roof or gums of the mouth to which such wax mould may have been applied for making a cast thereof, so that the pressure of the mould by the atmosphere to the roof or gums may be overcome and the mould removed without bending, twisting, or distorting it. For this purpose I make holes in the usual plates or frames for holding the wax intended to be applied to the roof or gums in such a position that holes communicating with the atmosphere may be made through the wax to the surface of the roof or gums in contact therewith; and, when the wax has been applied to the roof or gums, I then take a piece of wire or any suitable instrument (made blunt, so as not to injure the mouth) and push it through the holes in the plate or frame, and through the wax to the surface of the roof or gums, so as to let the air in between the mould and the roof or gums."

Drawings, accompany this specification, which however, are needless for our present purpose. Expired, September 8th, 1860.

1848. Henry Gilbert. — For improved mode or modes of operating in dental surgery, and improved apparatus or instruments to be used therein.

The first part of this invention consists of the arrangement of a bar of iron or other metal in connexion with the operating-chair, so as to be capable, by joints and screws, of fixed adjustment within the mouth of the patient, in such a way as to be used for a fulcrum, to rest the forceps, or other extracting instrument against, in

removing a tooth. In extracting *lower* teeth, the instrument is made to rest on the fulcrum from above, and against it from below, in the extraction of upper teeth.

The second part consists of a sort of key for the extraction of roots. There is a loose claw as in the ordinary German key, but the broad bolster or fulcrum, which in that instrument rests on the gum, is converted into a *fixed claw* which is placed upon the opposite side of the root. The shaft of the instrument is long and straight, and the handle is not placed transversely, but in the same line with the shaft. This instrument is used with the fulcrum, which forms the first part of the invention. Expires October 18th, 1862.

1848. Edwin Thomas Truman.—For improved method or methods of constructing and fixing artificial teeth and gums, and supplying deficiencies in the mouth.

ABSTRACT OF SPECIFICATION.

"Having got a model of the mouth in plaster, hardened in the usual manner with resin, &c., I proceed to construct a metal frame, by preference of gold, either of wire or otherwise, the purport of which is to give support to the pins for the artificial teeth, and to strengthen the piece where it would otherwise be weak, if it be a case that requires such strengthening, as in lower jaw cases, where the plate or bar has hitherto passed behind the remaining teeth; and as this frame is not, in the finished case, either to touch the gum or remaining teeth, but to be enclosed in the gutta percha, it is not necessary that it should fit the model, but merely that it should be constructed to effect the purposes above named. The teeth being prepared of the proper length and colour, I solder pins to receive them in the above-mentioned frame in their proper places, in the same manner I should if placing them on a gold plate of the usual make; but it is not necessary to fit them to the frame, as the gutta forms sockets around and under them, which receive them in like manner as teeth are naturally articulated in the jaw.

"I then proceed to mould or form the gutta percha, which I prefer to have as pure as I can purchase it; gutta percha, when heated, being, as is well known, very plastic, and readily pressed into any form. First, I entirely enclose the metal frame, as above described, in gutta percha, except the pins; this is readily done with the fingers. Then I place it on the plaster model, previously wet with cold water, in such a manner as to bring the teeth, when placed on their respective pins, into their proper place, to supply the deficiency. I then proceed to mould the gutta percha into the proper form, to replace all the lost structures, without altering the surface that touches the model; this I effect either by again making it hot in water, or by the aid of heated instruments, or by both, as the case may require, but for this part of my invention I can give no precise rule, as it must

depend on the case; and the gutta percha must, at the same time, if necessary, be carried over other parts of the mouth not hitherto deficient, as has been the custom with gold plate on other substances, either to equalise pressure or gain support.

"By this means the gutta percha will, with the new teeth, fit those parts of the mouth where wanting; and in order to make up for any imperfections in the plaster model, I warm the gutta percha of the artificial teeth constructed as above explained, and place the same into the mouth and press it into position, by which it will become perfectly adapted to the mouth. I then remove the same from the mouth, and take the teeth off the pins, by which the sockets in the gutta percha will be left empty. I then coat over the pins with wax or other matter, which will prevent deposit of gold in the process of electro-gilding, which I now cause to be performed within the sockets, also on outer and inner surfaces of the gutta percha, leaving the surface thereof which comes next the gums so that a surface of gutta percha will come next the gums. And such is the peculiar property of this matter, that it may be made most accurately to fit the gums, cavities, and imperfections of the mouth near the gums; and artificial teeth thus made will not require any other mode of fixing when in the mouth than what results from a good fit. I do not, however, say that in no case other fastenings may not be required, but in all cases which have come before me I have not found other fastenings necessary. The electro-gilding will line the sockets for the teeth, and also the external surfaces, such electro-gilding being performed, as is well understood, by preparing the surfaces to be gilt in the ordinary manner. The teeth are then to be fixed on to the pins and into the sockets by cement, as heretofore when using gold plates; and any of the various descriptions of teeth may be employed, to which, separately, I make no claim. It is not essential to making artificial teeth and gums, according to my invention, that the gutta percha used should be coated with gold. And I would state that, although I prefer to employ gutta percha alone, I do not confine myself thereto, as colouring or other matter may be used therewith.

"In carrying out the second part of my invention, in place of using gutta percha and electro-gilding as above explained, I employ hard wax or other matter which may be readily moulded or shaped in the forms described in respect to gutta percha, and then by electro-gilding the same all over I can obtain artificial teeth fitting with great accuracy; and according to this plan the moulded or shaped matter may be such as would be unsuited to be worn in the mouth if it were not for the coating with gold, which will not only give strength, but also prevent any moisture getting to the interior matter which constitutes the setting of the teeth.

"Having thus described the nature of my invention, and the manner in which the same is to be performed, I would state in respect to the first part of my invention, that I am aware that gutta percha has been before employed for temporarily filling up a space in the mouth caused by removing a tooth or teeth, and the same has been allowed to remain till artificial teeth for fitting such spaces have been prepared; and further, I have been informed that gutta percha has been used for making good some defects in the mouth, but not in connection with artificial teeth and gums, and I mention these par-

ticulars in order to state that I make no claim to such use of gutta percha. But what I claim is—

"First, the manufacturing of artificial teeth and gums, and making good other deficiencies of the mouth in connexion therewith by employing gutta percha; and I also claim the coating the surfaces thereof with metal.

"And, secondly, I claim the application of electro-gilding in the manufacture of artificial teeth and gums as a coating to soft materials, as herein explained."

Expires February 15th, 1863.*

1849. George Fellows Harrington.—For improvements in the manufacture of artificial teeth, and the beds and palates for teeth.

ABSTRACT OF SPECIFICATION.

"My invention consists—

"First, of improvements in the manufacture of artificial teeth when what are called mineral teeth are used.

"Secondly, my invention consists of improvements in the manufacture of the beds and palates for teeth and artificial palates where no teeth may be required by the application of tortoiseshell. And,

"Thirdly, my invention consists of improvements in the machinery or apparatus employed in the making of beds or palates for teeth. And in order that my invention may be most fully understood and readily carried into effect, I will proceed to describe the means pursued by me.

"Heretofore in manufacturing mineral teeth in sets or large pieces it has been usual to take a cast of the mouth or part thereof of a patient, and to obtain therefrom a model of the mouth or parts thereof, whether for the upper or lower gums, and this model is handed to the maker of mineral teeth, in order that he may make the teeth in accordance therewith, and the workman makes the teeth with the surfaces which come next the gums as nearly as may be to fit the gums, and formerly such teeth were made without the interposition of beds or palates of gold or other material, but in modern practice it has been usual for the makers of artificial teeth to employ gold (and in some instances other materials) as beds and palates for such teeth, and thus are sets or parts of sets of artificial teeth made. Mineral teeth, heretofore, when to be combined with teeth or palates, have been made in like manner from the model of the mouth and the parts or surfaces thereof which were to come next the gums have been made in accordance with the model of the interior of the mouth, and suitable to fit the gums of the patient, and the gold to form the bed or palate has been stamped into form, according to a model of the mouth obtained as before explained from the particular patient for whom the set of teeth are intended. The mineral teeth and the gold, having been made both to correspond with the mouth, they have had to be combined together, and this has been done by cutting away the surface

of the mineral teeth which is to come next the bed or palate of gold, such cutting away requiring careful and accurate workmanship, and which is more or less difficult, depending on the varied undulations in the gums or parts of the mouth which have to be covered by the beds or palates for mineral teeth, being composed of a substance which is first moulded and then vitrified, and it being a property of such substance to decrease in size to a considerable degree in the process of firing, and as the form and undulations of each mouth differs from all others, it has hitherto been found impossible to mould it so that it shall exactly fit the intended bed or palate after the piece of mineral has been vitrified; all which render the accurate fitting of artificial teeth a very difficult art, and the same is comparatively seldom well done. Mineral teeth have also been made in single teeth, and in small pieces of three or four teeth, without reference to any particular mouth, but a sufficient substance of mineral has been left at the base of each tooth or teeth to allow of its being cut away to fit a particular mouth, or part thereof, so that the same description of difficult workmanship is required in fitting as in cases where pieces of mineral are made for a particular mouth. Now, according to the first part of my invention, I manufacture mineral teeth with the surfaces which come next the palates or beds without reference to the nature of the particular mouth to which they may afterwards be fitted, and cause the palates or beds to be made on the one surface to correspond with the particular mouth to which artificial teeth are to be fitted, and the other surface thereof to correspond with the surface of the mineral teeth, so as accurately to fit the same, thus rendering the making of such surfaces of the mineral teeth first to correspond with the mouth, and then to cut away the same to allow for and adjust them to the bed and palate introduced between the teeth and the mouth unnecessary. In carrying out this part of my invention, I would state that I have found, on an extensive examination, that in the variation between extreme cases of the mouths of persons (so far as the sets of teeth are concerned) there is not a large difference, and that if four or five sets of teeth, slightly differing in dimensions, be made, such a series will, if the palates and beds be well made, be suitable for most if not all the cases which a dentist will be called on to treat; and, in carrying out my invention, I cause a series of distinct sets of mineral teeth to be moulded, each set being but in a small degree less or larger than another set, so that when a dentist is about to prepare for fixing a set of teeth he will take a cast of the mouth, in order to make the palate and bed correct to the mouth, and he will at once know which of the sized sets will be the proper one for the particular case. But in place of taking the cast of the mouth by the means of soft wax, placed in what are called 'model pans' of the ordinary kind, one part of my improvement consists in using model pans or sets with teeth, or projecting surfaces of the dimensions of teeth, so that a patient having two model pans or sets in the mouth at one time will, by shutting the mouth and pressing the wax (or plastic matter used) cause it to take the form of the two surfaces of the mouth, and the feeling and countenance of the patient will indicate whether the height and diameter of the teeth, palates, and beds, are agreeable and proper for the patient's case, by which means an exact measure for the set of artificial teeth will be ascer-

* The reader is here referred to Mr. Truman's admirable paper, "On the Necessity of Plasticity in Mechanical Dentistry," read before the Odontological Society of London, June 3d, and reported at length, pp. 152—160 of this Journal.

tained by the dentist, and at the same time casts for obtaining models will be obtained; by such means the dentist, if he record the dimensions, which he will be facilitated in doing by means of the measuring apparatus hereafter explained, will be able to complete a set of artificial teeth without in most cases requiring to see the patient more than once.

* * * * *

"What I claim is—First, the mode herein described of manufacturing artificial teeth where mineral teeth are used, whereby the making of the teeth to the particular case, or leaving a sufficient substance at the base of the tooth or teeth, to allow of its being ground or cut away to fit a particular case, and the subsequent cutting of the surfaces of the mineral teeth which come next the mouth, in order to fit the beds and palates, are rendered unnecessary.

"Secondly, I claim the manufacture of beds and palates for teeth, and of artificial plates where no teeth are required, of tortoiseshell. And,

"Thirdly, I claim the arrangement of machinery or apparatus herein described."

Here follows a description of a measuring apparatus, which, however, forms no part of the patentee's claim. Also a description of the apparatus used for moulding or shaping the tortoiseshell. Both these descriptions would be unintelligible without the drawings to which they refer; and although the latter is highly ingenious, it cannot be considered of any practical value at the present time to the dentist. Expires February 1st, 1863.

1850. Cuthbert Dinsdale.—For improvements in the manufacture of artificial palates and gums, and in the mode of setting or fixing natural or artificial teeth.

This invention consists, first, of making artificial gums of gold or other metal and enamelling them to resemble the natural gums; secondly, in making artificial palates in a similar manner.

In making a set of teeth with gums, a plate of copper or other metal, having tube teeth arranged upon it, is made to fit the mouth; the required gum is then modelled in wax upon this piece, and the teeth are carefully removed from their pins, leaving the wax gum and sockets uninjured; of these, models are made, and a plate, say of gold, is swaged and punched to their form;

the gold is then filed or cut out from the sockets, so that the teeth may drop into their respective places, and the situations for the pins be marked upon the plate that forms the base of the piece, and rests upon the palate or remaining gum. The pins having been soldered into their places, the two parts of the piece, viz., the plate that fits the mouth and that representing the gums, are soldered together, the teeth are replaced on the pins in the artificial alveoli, and secured there by the enamel.

The second part of this invention, viz., the making of artificial palates, will be best described in the words of the specification:

"Artificial palates I construct by first taking a wax model of the mouth where the deficiency exists, and then taking a cast in plaster of Paris, and afterwards in zinc and lead, as before stated for artificial gums. A metal plate must then be made to fit the zinc die, and care must be taken to see that it also fits the mouth. A wax arch or palate must then be modelled upon this plate as near as possible to the form of what the roof of the mouth ought to be, and when this is completed a cast must be taken from that in plaster of Paris, and zinc and lead dies made as in the former case. Gold or other metal plates, as the case may require, are then struck up by means of the lead and zinc dies, leaving the part hollow between the plate which will come against the mouth and the plate, which will form the artificial palate, and against which the tongue will come. Care must be taken that the cavity is made impervious to moisture, by screwing a pivot into the hole which may be required as an air hole in soldering and enamelling the parts. If thought desirable, the enamelling may be extended over the whole surface; but I prefer leaving that part uncovered with enamel that comes against the roof of the mouth. These improved palates are fixed in the mouth with clasps round the teeth or spiral springs, as the case requires.

* * * * *

"That which I consider to be new, and therefore wish to claim as the invention secured to me by the hereinbefore in part recited letters patent, is the manufacture of hollow metal gums, and coating the same with enamel, whereby an increased support will be afforded to the teeth, and a close approximation (in appearance) to nature will at the same time be attained. I also claim the manufacture of palates, as above described.

No formula for the enamel is given. Expires October 15th, 1864.

(To be continued.)

Hospital Reports and Case-Book.

EXTENSIVE ECCHYMOYSIS FOLLOWING WOUND OF THE CHEEK.

(THE POPLAR HOSPITAL.)

(From the 'Med. Times and Gaz.,' July 27th, 1861.)

THE following case, to which Mr. Brownfield, the resident surgeon, directed our attention at a recent visit to the Poplar Hospital, is curious as showing extensive ecchymosis from a small and limited wound. A man, *æt.* 72, was admitted on February 9th into the Poplar Hospital, under the care of Dr. Barr, for fracture of the angle of the lower jaw on the left side. The injury was caused by a cask falling against the jaw. Soon afterwards the ecchymotic swellings appeared about the jaw, and spread in irregular patches under the skin of the neck and on to the chest, and also upwards on the cheeks and to the opposite lower eyelid. The mucous membrane of the hard and soft palate was also very much distended. The effusion was about an hour in arriving at these limits. The swellings have since gradually subsided, leaving irregular, reddened, patchy stains.

CYST IN THE ANTRUM; PUNCTURE ON TWO OCCASIONS; CURE.

(GUY'S HOSPITAL. Under the care of Mr. BRYANT.)

(From 'The Lancet,' Aug. 31st, 1861.)

ELIZA F—, aged forty, applied with a tumour in her right cheek, of one year's growth. It was evidently an enlargement of the antrum, and, from its globular form, appeared to be cystic. Mr. Bryant introduced an exploring trocar and canula, and drew off two ounces of the peculiar glairy fluid characteristic of these cysts. The fluid, however, subsequently returned, and after the lapse of three weeks a free opening was made above the bicuspid teeth and within the mouth, giving exit to a quantity of fluid similar to the last. The cavity was

plugged with lint. Inflammation followed, and some suppuration, which has resulted in the contraction of the cyst wall, and a perfect cure.

She was seen three months afterwards, and no return had taken place.

TUMOUR BENEATH THE LOWER JAW; SUCCESSFUL REMOVAL.

(WESTMINSTER HOSPITAL. Under the care of Mr. HOLTHOUSE.)

(From the 'Lancet,' Aug. 31st, 1861.)

AN elderly female presented herself at the hospital, having a tumour situated under the lower jaw in the right mylo-hyoid space. It had been present for six years, and latterly commenced to grow rapidly. It was movable, and apparently unattached to any important structure; Mr. Holthouse therefore determined upon its removal. On the 21st of May chloroform was given, and an incision made over the growth, which with the aid of the handle of a scalpel was readily enucleated. Although no vessels of importance were wounded, yet there was free bleeding. The tumour was apparently an enlarged gland, but strongly resembling an albumino-sarcomatous growth. The patient made a good recovery, and left the hospital well.

A few weeks later we noticed a somewhat similar case under Mr. Erichsen's care at University College Hospital, in the person of a young woman with a tumour in the left mylo-hyoid region. It was attributed to enlargement of the glands in that situation from the presence of decayed teeth, and had resisted the means (chiefly iodine) employed for its absorption. The tumour was superficially situated, as large as an elongated fowl's egg, was movable, and its anterior surface coursed over by a large vein. Mr. Erichsen believed it might be an enlarged tuberculous gland undergoing calcareous degeneration, and so it proved on removal, under chloroform, on the 12th of June. In this instance also a good recovery resulted.

The situation of both of these tumours was over important parts, yet, as it was comparatively superficial, the operation in each was unattended by any danger.

ADHESION BETWEEN THE SEPTUM NASI AND LOWER TURBINATED BONE.

(GUY'S HOSPITAL. Under the care of Mr. BRYANT.)

(From the 'Lancet,' Aug. 31st, 1861.)

IN a recent number of the 'Guy's Hospital Reports,' Mr. Bryant has drawn attention to various diseased conditions of the nostril, which have been hitherto classed under the heading of *ozæna*. Ulceration of the mucous membrane of the nostril was one of them, and as a curious result of such a condition the following short case may be read with interest:

A man, aged forty-four, applied with an obstruction in his right nostril. He had experienced it for two years, and it had followed a "sore nose," which had lasted for two months. Upon examination, it was clearly seen that a firm union existed between the lower turbinated bone and the septum nasi. The nostril was also contracted.

From the history of the case, it appeared probable that both sides of the nostril had been originally ulcerated, and that union had taken place between the granulating surfaces. Mr. Bryant denuded the parts with a bistoury, and kept them apart by lint covered with oil. This was renewed constantly during the cicatrization, and recovery has taken place, the man being now well able to breathe through the nostril.

In the following case there was obliteration of both nostrils, but arising from an injury:

A man, thirty-five years of age, was admitted into King's College Hospital in March last, his appearance being most pitiable. He had been to the gold diggings of Australia, and whilst at work in a pit, a quantity of earth fell upon him, and smashed in the bones of the nose almost flat. This was accompanied by a terrible wound. The result was that the nostril were almost wholly obliterated, and the man had to keep in tubes to permit of his breathing through the nose. If removed, the nose would contract. Mr. Fergusson believed it possible that at the beginning the bones

might not have been sufficiently elevated, and he recently tried with forceps to accomplish this, or at any rate to so enlarge the passages as to permit of the wearing of tubes again. This, to some extent, was successful by means of the separation of the blades of a pair of very strong forceps in the nostril; but the ultimate success of the operation he looked upon as very doubtful.

CONGENITAL CYSTIC TUMOUR IN THE LOWER JAW OF AN INFANT; REMOVAL.

(ST. BARTHOLOMEW'S HOSPITAL. Under the care of Mr. COOTE.)

(From the 'Lancet,' Aug. 31st, 1861.)

A CURIOUS case of congenital deformity of the lower jaw was brought to this hospital, about three months ago, in an infant six months old. The right half of the bone was enormously enlarged, and occupied a prominent position in the neck, extending downwards as far as the chest. It appeared to invade the entire bone, but was really confined to the right side. Its increase had been rapid since birth, and as it was still enlarging, it became necessary to do something to afford a chance for life, as, if left alone, suffocation would have ensued in a short time. Accordingly, chloroform being given, an incision was made by Mr. Coote upon its outer part, and a thin shell of the expanded jaw-bone reached. This was opened, and the interior was found to be filled with a regular nest of cysts, one placed within the other, all of which were removed, and the cavity closed with lint. Very little blood was lost during the operation, and for a few days afterwards the child improved very much in health, although necessarily weak, and the great swelling of the neck was much diminished. Suppuration became freely established, and the drain shortly after began to tell upon the system, for the child became weaker and weaker, although well supplied with wine and good nourishment, and finally died from exhaustion.

Had a much earlier operation been resorted to, it is but reasonable to infer that a more fortunate issue might have resulted. We place the case upon record, inasmuch as, however common fissure and other deformities in the upper jaw may be, they are seldom seen in the lower.

FIBROUS TUMOUR OF THE ANTRUM EXTENDING THROUGH THE HARD PALATE INTO THE MOUTH; SUCCESSFUL REMOVAL.

(KING'S COLLEGE HOSPITAL. Under the care of Mr. FERGUSSON.)

(From the 'Lancet,' Aug. 31st, 1861.

THE patient in the following complicated case was the subject of two tumours, one situated in the right cheek, the other in the antrum and roof of the mouth. The growths were, however, perfectly distinct from one another. Both were removed at a single operation, which has been attended with the best results. From some remarks made by Mr. Fergusson at the time, we learned that he had seen the patient twelve months before, and the disease then presented so malignant an aspect that he dissuaded her from undergoing any operation. Some months later, the disease in the mouth was found to be an ulcerated, sloughy-looking mass, and the finger could be readily passed alongside of it into the antrum. Perceiving that its progress had been slow, and that it was within the reach of surgical aid, he thought he would give her a chance, more especially as there was no development of disease in any other situation, and the tumour in the cheek was quite distinct from that in the jaw. The steps in the operation are detailed in the notes of the case furnished by Mr. G. Fortescue, house-surgeon to the hospital. Mr. Fergusson could not accomplish all he wished in regard to the incisions which he ordinarily practises, inasmuch as he had not only to remove the upper jaw, but also the soft palate, besides the tumour in the cheek. The passage of the right nostril was free, for the tumour had not extended far in that direction; nor did it involve the orbit.

M. C—, aged thirty-eight years, a domestic servant, unmarried, of good complexion and healthy appearance, admitted April 27th, 1861. On admission the right side of the face was extremely deformed and prominent. The prominence was due, in a great measure, to a tumour imbedded in the right cheek, in front of the masseter muscle, about the size of a hen's egg, hard, smooth, and moveable, with the skin over it natural and unadherent. On looking into the mouth, a foul, ulcerating growth was seen protruding through the hard, and involving also the soft, palate of the right

side, which were both bulged downwards towards the floor of the mouth, extending backwards to the anterior pillar of the fauces, and encroaching to some extent on the nostril of the same side. The orbit was not concerned in the growth, and the eye appeared natural, but occasional attacks of double vision were complained of. The glands beneath the jaw was not affected. The history of the affection was somewhat obscure; but the first symptom of disease in this locality occurred (she said) some thirteen years ago, as a swelling in the throat about the right tonsil, commencing without pain, but soon impeding the power of deglutition, which was regained, however, after the growth had been cut into by a surgeon. Soon a tumour began to appear in the right cheek, and, growing for six years, was removed by the knife seven years ago. The duration of the present disease seemed very uncertain; it had existed, however, for several years, and of late its progress had been rapid.

May 4th.—Chloroform was administered, and Mr. Fergusson proceeded to remove the disease. An incision was made through the upper lip, near the middle line, into the nostril, carried upwards along the ala of the nose, and, finally, taken horizontally outwards upon the malar bone, close beneath the margin of the orbit. The flap was dissected up, and the tumour, after a very few touches of the knife, squeezed out from the cheek. A tooth was then removed in front, and the saw carried upwards through the hard palate, and transversely below the orbit, cutting through a portion of the malar bone, together with the superior maxilla. Next the cutting pliers were used freely, and the mass removed piecemeal. Some soft diseased tissue remaining behind was cut off with the curved scissors. The bleeding, free as usual in these cases at first, ceased speedily of its own accord. The wound corresponding to the division of the upper lip was brought into apposition by two hare-lip pins, the remainder by interrupted sutures. Very little disfigurement resulted from the operation. During the proceedings on the mouth the effect of the chloroform was kept up very successfully by Dr. Sansom, by means of an india-rubber tube introduced through the disengaged nostril.

7th.—The wound, kept covered with water-dressing, is rapidly uniting; the mouth is washed out frequently with myrrh and tannin gargle; she seems to suffer little, and takes liquid food well. The pins removed from the lip.

9th.—The sutures removed; the wound almost entirely healed.

17th.—Union of the horizontal incision delayed by the formation of a small superficial abscess beneath it, which has been opened, and has refilled several times in succession. The lower eyelid appears slightly oedematous.

27th.—The incision healed. The wound inside the mouth is granulating up, and a very slightly perceptible falling in of the cheek remains. She takes solid food without difficulty.

May 5th.—Discharged.

July 16th.—The patient presented herself for examination to-day. There has been no return of the growth. The de-

formity is barely noticeable. The excavation is for the most part filled up, and a slight depression in the roof of the mouth, with a small, irregular aperture in the palate, alone mark the site of the operation. Some oedema of the right lower eyelid remains.

The softer part of the disease appeared, on microscopical examination, to consist mainly of a fibro-granular matrix, containing numerous corpuscles, round, regular, of uniform size, granular, and with no appearance of nuclei. The much firmer tumour of the cheek contained corpuscles of a similar character, with a larger proportion of the fibrous element.

British Journal of Mental Science.

LONDON, SEPTEMBER, 1861.

At this season of the year, London is airing itself. Several of the most important thoroughfares are up, and the narrow bye-streets, usually so stagnant and close, are astir, and the confined air is agitated by the passage of omnibuses, cabs, vans, and such like, advantageous no doubt as regards the sanitary condition of the locality, but of doubtful tendency as regards the morality of language used by wayfarers, especially those who happen to be in a hurry.

London is empty, the world says so; and what the world says, we, who are not yet struggling in the vortex of materialism, feel bound to believe;—leastways, it is an old saying that "what every one says must be true;" nevertheless, holding as we do an amphibious position; being in the world and out of it—we cannot help calling to mind the two millions, and something like five hundred thousand individuals who, though out of the world, are unfortunately for themselves, not out of London. Making then due allowance for this insignificant portion of the popula-

tion, we go with the world and say, London is empty; in as much as the well to do, and the "haut ton" have flitted away, flunkies and powder, carriages, horses and all. North, south, east, and west, sea board and inland, abroad and at home, pale and blasé'd faces, the representatives of toil in fashionable life, and of hard labour too, as applied to seeking new pleasures, or searching after new sensations, are met; and met too, are equally pale faces, but accompanied by signs of fatigue, produced by over worked brains, and the thoughtful expressions, the result of severe mental training, and too often the "wrinkled fronts" and careworn, which speak of hard and stern times, prominent features which tell of the toil of professional men, and those engaged in business.

The pale face of fashion, and the pale face of toil, both yield to the influence of nature; both brighten and freshen. The habitués of Rotten Row and the park in the morning, and of the crush in the evening, relax in the sunny scenes, and

unbend beneath the charms of the country, whilst the owners of sallow cheeks who left London depressed by work and anxiety, are tranquilised by rest and cheered by the freshness and beauty of surrounding scenery, receive the tint of health, and become bronzed by air and exercise.

It is they whose lot oblige them to constant work, who alone realize the sensation of completely forgetting for a time, the drudgery and stern routine of professional and business life. With what a comfortable sensation does a man retire to rest on the first night of his holiday, and wake up in the clear bright morning with the sun, and the fact staring him in the face, that he has nothing to do but enjoy himself to the utmost! feeling that he has a right to enjoy himself, having earned his rest by months of laborious wear and tear of mind and body.

Annual vacations are of essential service to all who are actively engaged in business of any kind: the monotony of daily close occupation is broken, and time is afforded for irritation consequent on overtaxed mental and physical energy to subside, and when we come back to our work, we seem to carry it on with more ease to ourselves and far more effectively.

We are glad to find our professional brethren have not been behindhand in the search for health and recreation. We have heard of them on Snowden, hurrying over the Simplon and Splügen, or bound to the north of the Tweed; and others, again, who are less migratory in their habits, spending their time at the sea-side. The pecuniary sacrifice involved in such trips is slight as compared with the benefit received. In our immediate branch of the profession, health is of the utmost importance; there is so much physical hard work accompanying each daily routine of practice, that a period of rest is necessary on that account alone. When we consider, however, the close confinement we have to endure—the variety of breaths we must of necessity inhale—and the multitude of

annoyances which must be experienced, and we must put up with—besides the contingent mental work which must be done by those who wish to take a position in their profession beyond that of every day labourers—a two or three weeks' holiday should be considered a necessity—a sanitary measure indeed, not to be dispensed with. If a few guineas be lost, and a few of our patients be compelled to go elsewhere, it is of small account. We, at all events, return better able to work, soon make up for lost time and lost guineas, and we are in a condition of health which renders us more likely to keep practice together: practice will stick to us if we will only stick to it; and it would be shortsighted policy to neglect that which after all is the mainspring of success—health.

THAT the interests of the majority should overrule, and take precedence of the interests of the minority is in all public movements a principle universally admitted, and in a free country as universally acted upon. The case put forward by our correspondent, Mr. Fothergill, is a pleading in favour of the minority. He advocates the cause of professional advertisers, and fully justifies his own position as respects the College of Dentists, although he fails to justify the proceedings of the quasi-college.

In the discussion of a general question, special and individual cases cannot be considered. We must first of all determine whether dental surgery is to be practised as a profession, or pursued as a trade. If as a profession, then the universally adopted professional canon, which condemns professional advertising, must be applied to it as to other professions; if as a trade, no reasonable objection can be made to the use of advertisements by the dentist. It is clearly the duty of the College of Surgeons, as the home of professional men, to discourage advertising; and the duty of the Odontological Society is not less clearly defined. In reviewing the habits of dental practitioners generally, we find the few only advertise,

the majority giving an unequivocal condemnation of the practice by its strict avoidance. The candid consideration of these general facts leads, as we think, to the inevitable conclusion that those dentists, to wish to be accepted as professional men, must forego the use of advertisements. They cannot, at one and the same time, secure to themselves the advantages of a professional position and the supposed gain derivable from a trade usage. If Mr. Fothergill will examine for himself an extended collection of dental advertisements, he will see that the mere announcement of visits, coupled with the statement of the profession of the advertiser, passes by such insensible degrees into "others of a notoriously different character," that it would be practically impossible to draw a line of distinction upon which a general rule could be founded. Moreover, he will find many examples where the two forms of advertisements he alludes to are used alternately by the same individual. The more he extends his research in this direction, the more strongly will he be convinced that, if the interest of dental surgeons as a body be considered, the practice of advertising must be strongly discouraged. He may find a few isolated instances where the general rule may appear to press with some degree of hardship, but is there any general rule adopted for the public good to which some exception cannot be found? The particular instance of hardship to which he draws our attention we cannot admit as established.

We do not admit the necessity that a dentist residing in one small town should advertise his visits to other neighbouring small towns. In small towns every resident is known, and every regular visitor is equally well known; and we could adduce instances where a dentist has secured to himself the practice of "a group of towns, none of them large enough to support a dentist," without the use of a single professional advertisement.

In fact, the difficulties of acquiring practice encountered by a competent practitioner are far greater in large than in small towns. London and two or three of the great northern towns are the principal centres from which the more notorious advertisers operate; and we know of cases in which their visits to provincial towns have been rendered fruitless by resident practitioners, who have strictly abstained from fighting them with their own weapons—advertisements.

We cannot compliment 'The Dental Review' upon the specious arguments adduced in favour of the use of mild advertisements; but we congratulate the managers of that periodical upon the open advocacy of a system which, for some years past, has tended to lower the position of the dental practitioner, and which by its baneful influence has stirred up the profession to its present state of activity. But for the acknowledged degradation, the present successful exertions for the elevation of the dental surgeon would not have been made.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

To the Editor of the 'British Journal of Dental Science.'

SIR,—Will you allow me space in your pages for a remark on the articles you have recently extracted from the 'Lancet,' with your comments thereon, as they affect my-

self; and to complain of the injustice of introducing my name and that of my brother, as spots on the reputation of the college, when the truth is that we have never infringed its rules.

Our practice lies in a group of towns none of them large enough to support a

dentist, and where, when we commenced, there had been no resident dentist. We adopted a simple form of advertisement to make our arrangements known, which in 1857 was submitted, with our replies to certain interrogatories, to the council of the college, and we were informed by Mr. Alfred Hill (then corresponding secretary) that the council "had considered them, and were entirely satisfied therewith."

It is possible that what was proper in 1857 may be less so in 1861, and that the march of improvement may render it altogether inadmissible—we must be prepared for such a result; but if respectable men in country towns are not allowed to advertise their appointments, it will necessarily throw a large amount of valuable practice into the hands of others of a notoriously different character.

I am, sir,

Yours, &c.,

WILLIAM FOTHERGILL.

Darlington;

Sept. 5th, 1861.

To the Editor of the 'British Journal of Dental Science.'

SIR,—Please be so kind as to insert in your next impression, in contradiction to the statement, malicious as it is false, which appeared in the 'Lancet' of August 10th, and reproduced in your journal, that I have discontinued advertising in any paper or periodical for nearly two years.

I am, sir,

Yours, &c.,

G. WATLING.

To the Editor of the 'British Journal of Dental Science.'

SIR,—It would be a great boon to dentists holding public appointments, if the makers of operating-chairs would turn their attention to the production of a chair suited to the purpose, at a moderate figure. A dentist, on taking possession, as it were, of his new post, generally finds himself called upon to operate without any of the appliances to which he has been accustomed at home. His instruments are probably few and defective, but out of his own collection he may be able to supply those that are the most necessary. His operating-chair, however, is seldom better than an ordinary cane-bottomed chair. To perform the operations satisfactorily in it is impossible, but there is no remedy. To apply to the authorities, particularly if the appointment is of recent origin or only lately filled, is a step which he hardly likes to take; and even were he to state his case, he is not in a position, as far as I am aware, to point out any chair which would come within the reach of the committee of a charity. I do hope that some maker will produce a suitable chair, and I am sure that the dentists holding the appointments where the arrangements are defective would willingly pay for chairs out of their own pockets, rather than tax the funds of the institutions where they hold appointments, if they could do so at a moderate figure.

I have no doubt that there are some institutions where the arrangements for the dental officer are all that could be desired; but I am more certain that there are others where such, unfortunately, is not the case.

I am, sir,

Yours, &c.,

L.D.S.R.C.S.

Literary Notices and Selections.

FROM A COURSE OF LECTURES ON PAIN, AND THE THERAPEUTIC INFLUENCE OF MECHANICAL AND PHYSIOLOGICAL REST IN ACCIDENTS AND SURGICAL DISEASES. By JOHN HILTON, Esq., F.R.S., Surgeon to Guy's Hospital, Professor of Anatomy and Surgery to the Royal College of Surgeons.

(Delivered in the Theatre of the Royal College of Surgeons.)

(From the 'Lancet,' Aug. 31st, 1861.)

Furred Tongue on one side, depending on Disease within the Cranium.

THE first time I had an opportunity of clearing up such a case as this occurred in 1848. On December 17th, 1848, with Mr. Blenkarne, a surgeon in the City, I examined the body of one of his patients who had died with disease of the brain and spine. She had suffered from intense pain on the left side of the head. She had also, during her life, a furred tongue on the left side, and scarcely at all on the right side. It therefore became an important point to clear up what was the probable cause of that condition of the tongue. We made a post-mortem examination, and found a diseased spine, as was anticipated. Then, upon very careful examination of the head, for the especial purpose, on turning up the dura mater from the anterior part of the petrous portion of the left temporal bone, we exposed the Gasserian ganglion, or the ganglion of the fifth nerve, and there we found what might be called a scrofulous deposit upon the convex edge of this ganglion, involving the second division of the fifth nerve, more than the third, but still involving all more or less. Here, then, appeared to us to be the explanation of the probable cause of the furred tongue on its left side. This observation was made in 1848; the disease was near the ganglion of the fifth nerve, and on the same side as the furred tongue. If I should not mention that fact again, it will be clearly understood that the diseased condition of the tooth, or of the fifth

nerve, was always found on the same side as the furred tongue, and that the fur was confined to the anterior two thirds of the upper surface of the tongue, over the distribution of the lingual gustatory nerve—a portion of the third division of the fifth.

In 1844, when delivering some lectures upon the nerves at Guy's Hospital, I mentioned this case, and one other that I had seen before, the cause of which I had not distinctly proved. After the lecture, one of the students said, "Look at my tongue; it is furred on one side, and I cannot get rid of it." This sketch was taken from his tongue in 1844. He had a decayed and painful tooth—the second molar in the upper jaw. That tooth was, by my advice, removed, and after a short time the fur on the tongue entirely ceased. Now here, in this case, appeared to be a demonstration, as far as we could judge from these concurrent circumstances, of the probable cause and effect. Here was a painful and diseased second molar tooth in the upper jaw, on the same side as that on which the tongue was furred, and apparently the cause of that condition; for as soon as the tooth was removed the fur on the tongue ceased, and the two sides became quickly alike. This case seems to confirm the opinion as to the cause of the unilateral furred tongue; but there is this peculiarity and difficulty in the explanation, which I am anxious to admit—that instead of the cause being associated with the third division of the fifth, as you might expect from the lingual gustatory nerve supplying that part of the tongue which is furred, in all the cases which I have seen where the cause was connected with the teeth the seat has appeared to be the first or second molar tooth of the upper jaw (the second division of the fifth nerve) on the same side as that on which the tongue is furred. I must leave others to explain how that occurs. I am responsible for the accuracy of the facts which I have advanced, but I cannot explain the relation of cause and effect in these instances.

Furred Tongue on one side; Second Molar Tooth of Upper Jaw Diseased.

This hot spring, a lady, whom I have

known for some years, consulted me regarding some matters not of importance, and I, perhaps not for any very precise purpose, said, "Let me look at your tongue." She put out her tongue, and it was furred on one side. I said, "You have a bad tooth," and she thought it was exceedingly clever on my part. "Yes," she replied, "and I am going to Mr. Bell to have it taken out." She went and had it extracted; I saw her a fortnight afterwards, and all the fur had subsided. This was a second molar tooth in the upper jaw of the same side as the furred tongue.

Very recently my own boot maker had some little accident, and he came to my house to consult me. I found he had a furred tongue on the right side, and I remarked to him, "You have a decayed tooth in your upper jaw." "No," he said, "I have not; but I have had a bad tooth stopped, and it is very painful when I touch it in this way (pressing his finger upon his cheek over the tooth); almost the whole of the time since I had my tooth stopped my tongue has been like this."

Now, these cases, taken together, and made into a series or small group, seem strongly to suggest the influence of irritation or of pressure upon what we may call common spinal nerves, grouping the fifth nerve as a common spinal nerve, although it has its relation only with the face and the head.

Gray Hair on the Temple depending on a Decayed Molar Tooth in the Lower Jaw on the same side.

This spring a person was brought to me by a surgeon suffering very great pain on the left side of his face. He was much exposed to the weather, and he suffered a great deal in consequence. He had taken many things to cure the neuralgia, as it was termed. I observed that he wore a wig, and I asked him the reason. He said, "Curiously enough, the hair on my left temple has all turned gray. I did not like to have black hair on one side and gray on the other, so I had my head shaved and wear a wig." Upon examining his mouth I found he had a decayed and painful molar tooth on the left side of the lower jaw—the third division of the fifth nerve. The patch of gray hair appeared to me to be the effect of the nervous association of the temporal branches of the third division of the fifth nerve and the decayed tooth in

the lower jaw. When this second molar tooth in the lower jaw was extracted the neuralgic pain very nearly ceased. I have not seen the patient since, and cannot say whether the hair has recovered its colour. All I can say is, as it was stated to me, that during the time he was suffering extreme pain on the left side the hair over the temporal region became nearly white—that difference in colour suggesting to myself some structural deterioration, and to the patient the propriety of having his head shaved and wearing a wig.

Diseased Molar Tooth of the Lower Jaw producing Excoriation of the Auditory Canal on the same side, and an Enlarged Lymphatic Gland, cured by removal of the Tooth.

In last year's lectures I mentioned that a professional friend of mine had suffered from a condition bearing on the subject of the influence of nerves upon the structures supplied by them. That friend, unfortunately, is no more. It was Dr. Addison to whom this happened. The case is one of some interest, and I will repeat it in a few words. Some years ago Dr. Addison had a very offensive discharge from the auditory canal of one of his ears, which annoyed him very much; and below the external ear was a small gland enlarged in the upper part of the neck. He had tried various remedies for this discharge, and had gone, I believe, to some surgeons who attended specially to the ear; but, as far as I could learn, no good resulted from any of the applications. Upon examining the ear from which the offensive discharge proceeded, I found a slight ulceration upon the floor of the auditory canal. On arguing the question out between us, we came to the conclusion that the ulceration probably depended upon a diseased molar tooth in the lower jaw, on the same side. We had that tooth extracted, and in a very short time the ulcer healed, the discharge and morbid secretion disappeared from the auditory canal, and as soon as that ulceration was cured the enlarged gland subsided. Here the true cause of error was remotely situated from one of the most prominent symptoms, namely, the enlarged gland in the upper part of the neck: in that respect the case is of great interest. The case stands also in nice and close association with this group of results of nervous disturbance which prove that irritation induced in a nerve, or pressure upon a

nerve, is sufficient to lead to more or less change in function and structure, and that that morbid influence may after a time induce deterioration resulting in, or sufficient to produce, a furred tongue, ulceration of skin, or gangrene of the fingers. In Dr. Addison's case there was an ulceration in the auditory canal, and the gland enlarged as the consequence of the exposed lymphatics absorbing and carrying the morbid fluid of the ulcer down to the lymphatic glands. That I believe to be the true interpretation of glandular enlargements from the irritation, as it is termed, of a remote cause; the "irritation" is supposed to travel along the lymphatics to the anatomically associated glands. I believe this hypothesis of irritation is an erroneous

idea, and that the true explanation is, the arrival at the gland of a morbid fluid conveyed to it by the lymphatics. I doubt the validity of the reasoning which endeavours to press upon us the conviction that mere irritation can be conveyed from a sore to a lymphatic gland; it must be that the absorbents carry a morbid fluid centripetally to the gland. Fortunately for us, these glands are highly conservative in their tendency, and they stop the progress of the morbid fluid in its onward course towards the circulation of the blood, where its damaging influence might be more diffused, and lead very frequently to the occurrence of the more serious general condition which we are in the habit of denominating pyæmia.

The Month: Miscellanea and Scientific Intelligence.

THE COLLEGE OF DENTISTS.

(From the 'Lancet,' Aug. 24th, 1861.)

To the Editor of the 'Lancet.'

SIR,—I feel it to be due to myself, as well as to the readers of your journal, to make a few remarks upon a portion of Mr. Waite's letter, which appeared in your columns on the 10th instant. I allude to that part of it where your charge against the Council of the College for having certain advertising persons on the list of members is attempted to be answered by throwing the responsibility on the Scrutiny Committee. At the time referred to (December, 1856), I was requested to act as honorary secretary to that committee, and, although a considerable time has elapsed, I have a tolerably distinct recollection of some of the proceedings which then took place. We were then labouring under immense difficulties—difficulties which have now passed away, and which leave the road clear for those who would now occupy such a post. Our acquaintance with the dentists of the three kingdoms was small; their modes of practice to a large extent unknown to us; the difficulty of ascertaining impartial and reliable information as to their professional conduct generally was palpable from the first glance; and our entire effort was permeated with the conviction that the

process of purification must be of necessity slow. The Committee felt that they had undertaken a necessary but extremely delicate office, and any unbiassed mind would be prepared to allow a tolerably broad margin for casualties under such circumstances. The object was to purge the list of members, and the Committee acted up to the full extent of their then power. At this distance of time, and with no memoranda to guide me, I cannot say positively whether Messrs. Dagnall, Wotton, Neep, and Moseley signed the declaration to abstain from all advertisements but those which should receive the sanction of the Council; but I may safely affirm that they received communications from me on the subject, if their announcements were submitted to the committee, about which I have not the least doubt. It would only be just if Mr. Waite would run his eye through the more than 2000 letters which I received in about two years, and the answers of importance which he may find under my own hand, and acknowledge the many efforts made by that Scrutiny Committee to perform the duty imposed upon it. I might say that one member of that Scrutiny Committee still holds, and has ever held, a seat at the Council, and therefore has been a party to the continuance of what Mr. Waite

considers an error; but I refrain from laying stress upon this circumstance, because I believe that he, with the others, did what he could. Nevertheless, I must correct the president in his assertion that the "Committee of Scrutiny was appointed to revise the list of members, and finally to decide who were fit and proper persons to be retained, and who should be rejected." The Scrutiny Committee prepared this list; the Council finally adopted and endorsed it. If the Scrutiny Committee left the College such an unworthy "legacy," what need had they to receive it, use it, and follow in its steps? Nay more, why need they go from bad to worse, by relaxing their regulations, and extending the facilities for irregularity by the easy acquisition of a valueless certificate? There is much that is specious in Mr. Waite's letter, but it will not bear analysis; for who cannot see that what was impossible, or next to impossible, when commencing an institution, becomes both easy and practicable with five years' experience brought to bear upon it. What logic is there in Mr. Waite's remarks! Given, a certain bad "legacy" is left to the College; the College receives it; and when, at the end of a certain number of years of progress (?) the use of that legacy is called in question, the reply is, that it is "rather as evidence of their own (the donors') culpability and neglect than of any desire on the part of the present Council to countenance such things." There used to be, Sir, "a black book," containing the names of advertisers and a copy of their advertisements. I fear that it is given up or neglected very much by the authorities at Cavendish Square.

You will allow me, in conclusion, to say that I only speak the sentiments of the majority of the influential dentists when I assure you that the able remarks you have made upon this subject are highly appreciated; and although I have no actual permission to say this, I venture to do so, and moreover believe that, although (perhaps) the last, Mr. Waite himself will not be the least thankful for your straightforward and practical dealing.

I am, Sir, yours respectfully,

ALFRED HILL.

Boulogne-sur-Mer;
August, 1861.

A MILITARY DENTIST.

(From the 'Lancet,' Sept. 7th, 1861.)

To the Editor of the 'Lancet.'

SIR,—If no appointment has been made to Fort Pitt, why is Mr. Cox Smith allowed to advertise as follows?

Yours, &c.,

INQUIRER.

August, 1861.

"Mr. Cox Smith, Member of the College of Dentists, Dentist by appointment to the Military Hospital at Fort Pitt, Chatham," &c.—'Maidstone and Kentish Journal,' August 20th, 1861.

* * We can state on authority that nothing is known at Chatham as to any special appointment of Mr. Cox as dentist to Fort Pitt. The principal medical officer at Chatham was informed that he was at liberty to request the services of Mr. Cox in any case in which he might think it advisable; but there is no such appointment recognised as "Dentist to Fort Pitt," as far as we can ascertain.—ED. L.

CHLORATE OF POTASH.

In a paper on the physiological action of the chlorate of potash, translated for the 'Boston Med. and Surg. Journ.' (August 9th), it is stated that "Dr. Isambert experimented upon himself and others with the following results. He found—1st, That the chlorate of potash is absorbed and eliminated with great rapidity, and that it is eliminated unchanged (still in the form of a chlorate), and consequently cannot furnish oxygen to the system, as has been supposed. 2d. That the principal channels for its elimination are the salivary glands and kidneys. Traces of it are detected in the saliva within five minutes of its ingestion, and ten minutes later in the urine. At the end of a half hour the process is at its maximum intensity, and it persists from fifteen to thirty-six hours. The duration of the elimination does not seem to depend upon the dose. It was nearly the same with doses ranging from one to twenty grammes daily. Dr. Isambert has detected it in the milk of two nurses who were taking it as a medicine. He has found it in the nasal mucus, the tears, and perspiration. Its presence in the fecal matters he regards as doubtful, but thinks there is reason for believing that it passes into the bile."

In addition to other facts, Dr. Isambert mentions the following as the result of his observations on this subject:—"Doses of from one to four grammes daily produced no appreciable results. Doses of eight or more grammes induced a decided impression, lasting two or three hours; this was accompanied by a saline taste, apparently identical with that of the chlorate of potash. Although less powerful than a mercurial salivation, the results of over-stimulation were apparent in a weakness of action of the salivary glands for five or six succeeding days. A slight alteration in the voice was noticed. The intensity of the salivary excitation was proportional to the dose administered."—(*From 'The Dental Cosmos,' Sept., 1860.*)

SALIVARY CALCULI.

DR. H. B. BURNHAM records (*ibid.* July 19th) a very interesting case of salivary calculus, which occurred in a man "aged forty-eight years, of spare habit and slender constitution, who some fourteen years since was seized with a severe pain under the left side of his tongue. He applied to his family physician, who could give him no satisfactory information as to the cause or nature of his complaint; neither could he afford him any relief. He was induced to consult other physicians in his vicinity, and he did so with like results. In the mean time, a small tumour made its appearance on the under side of his tongue, near or at the seat of pain. He went to Boston and consulted the late Dr. —, who informed him that his disease was cancer, and gave him but little encouragement as to any permanent relief. He returned to his home, determined to abide the result of what he then supposed an incurable disease. From that time until about the 1st of February last, he has suffered paroxysms of severe and excruciating pain at different times. The tumour gradually increased in size, and the paroxysms of pain became more frequent, until it finally became inflamed, suppurated and burst, discharging a small quantity of pus and a calculus weighing fifteen grains, having the general appearance of ordinary renal or biliary calculi. He has since been entirely free from pain."

Another case of this kind is thus reported in the proceedings of the Boston Soc. for Med. Improvement, in the same journal of a subsequent date:—"The specimen was exhibited by Dr. Jackson, in the name of Mr. Frank D. Beer, a member of the present medical class. The patient, a

man forty years of age, had been under the care of Dr. Hammond Johnson, of Charlotte Town, Prince Edward's Island, and with whom Mr. Beer was a pupil. For some months he had had severe neuralgic pain, with a considerable drawing down of the right side of the face; an external swelling then appeared below the lower jaw upon the right side, and it was thought a fistulous opening would form. In about a week, however, this subsided, and a corresponding swelling appeared, internally, about opposite the canine tooth; in a few days the calculus appeared at a small opening, and was readily extracted by the forceps, with an entire relief from the pain, and improvement of the general health, which had previously declined. The calculus, which was supposed to have formed in the sublingual gland, was equal in bulk to about one third of an inch, and presented the usual appearance of such bodies, excepting the form, which was quite irregular. The chemical composition was, as usual, according to Dr. Bacon, phosphate of lime, with a little carbonate of lime and organic matter."—*Ibid.*

CHEMICAL GLEANINGS.

In the course of an instructive article on the estimation of silver, in the 'Chemical News' (May 9), Mr. Frederick Field states that "Mr. Napier, of the Mexican Mint, in two very interesting memoirs upon the action of heat on gold and its alloys with copper, and upon deposits in the chimneys of furnaces used for the fusion of the precious metals, communicated to the Chemical Society (vols. x and xi), proves very satisfactorily that on heating an alloy of gold and copper to the fusing point the volatility of the former metal is owing, in a great measure, to the presence of the copper, and from the analyses of the deposits in the chimneys there can be little doubt that a great part of the silver volatilized was evolved in combination with the same metal. From my own experiments I am convinced that the presence of copper exercises a most material influence upon the loss of silver in cupellation, and my ideas have been fully confirmed, not only by several French chemists, but by the very extended investigations of M. Domeyko, Professor of Chemistry and Mineralogy in the University of Santiago de Chile."

The journal just named says that "M. Bolley has noticed the existence of a soluble double silicate of lime and soda. This salt is formed when a solution of silicate of soda

is added to lime-water. It is amorphous, transparent, and, when heated, melts into a clear glass. Baryta and magnesia also form soluble salts with silicate of soda. These facts, the author remarks, are of much importance in studying the silicization of stones, and have no less interest in connection with geology. They may also throw some light on the formation of the framework of vegetables."

The following account of a natural borate of lime is from the same source:—"For ten years, says the 'Moniteur Scientifique,' a white salt has been imported from Chili, consisting of brilliant, silky crystals agglomerated into nodules of greater or less size. According to M. Salvétat, it contains twelve per cent. of boracic acid, and according to other chemists, fifty per cent. The other constituents are sulphate of soda, earthy matters, and sand. This borate of lime, according to its richness, may be used directly as a flux, and M. Salvétat has substituted it for borax in glazing Sèvres ware. He has succeeded in forming a glaze of good quality by melting together one part of this rough borate of lime, two parts of sand, and four parts of minium."

The employment of chromic acid is recommended (*ibid.*) as an efficient means to distinguish silver. Thus, "a solution of chromic acid or a mixture of bichromate of potash and sulphuric acid gives silver money, jewellery, or an alloy rich in silver, a purple red spot, due to the formation of chromate of silver. With the imitations of silver this does not take place."—*Ibid.*

THE PAROTID GLAND.

In a communication to the 'Louisville Monthly Med. News' for July, Dr. Gerhard Paoli treats of the diseases of the parotid gland, and maintains the possibility of its entire extirpation. The following are extracts therefrom:—"I shall first, before attempting to prove that many distinguished surgeons have extirpated the parotid, briefly mention the diseases to which the organ is subject. To these belong carcinoma, osteoides, enchondroma, induration, hypertrophy, sialisma, hydroma, aneurism, lymphatic and many other tumours."

"Sialisma. These tumours, which are also described under the name of abscesses, or tumores salivales, consist of a collection of thick saliva, contained in a closed sac in the parotid; but instances of these are so rare, that in the annals of medical science very few are recorded; they are the same for the

parotid as ranula for the sublingual gland. These tumours sometimes contain sand, or small calculi salivales; they differ in size from a nut to a goose-egg, and even larger. Felix Plater describes such a one. Keemer describes a similar tumour.

"Hygroma. Rokitsansky. These also appear very seldom, and are distinguishable from sialisma by their not containing saliva, but a thin divers-coloured fluid, clear as water, which is contained in a sac. Henry observed such a tumour in a child of four years of age, which had suffered therefrom from its earliest years. It developed slowly without pain, together with a feeling of fluctuation; at the first attempt to remove it, six ounces of a clear fluid flowed out. Valker and Wutzer have described a similar case."—*Ibid.*

To Correspondents.

NOTICE.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.

"E. Ward, Sheffield."—We will make the inquiries for you.

Communications have been received from Messrs. C. Spence Bate; D. Daldy; J. Hilton; George Owen; William Fothergill; G. Waying; "L.D.S.R.C.S.;" and Samuel Cartwright.

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British Journal of Dental Science.

No. 64.

LONDON, OCTOBER, 1861.

VOL. IV.

Dental Surgery and Medicine.

BRIEF NOTICES OF SOME FEW CASES OF DISEASED TEETH, RECENTLY PRESENTED TO THE MUSEUM OF THE DENTAL HOSPITAL, SOHO SQUARE. BY J. L. LEVISON, ESQ.

It is patent to all observers that in dental affections, as in all other instances of diseased organs, the report of cases may be useful to the student and aid the more profound practitioner to deduce certain generalizations by which to acquire a more correct knowledge of the laws on which such peculiar conditions depend.

It is in this spirit that I offer a few particulars for your Journal, of some of the diseased teeth and stumps which I propose giving to the museum of the Dental Hospital, Soho Square, through Mr. Underwood.

Paper marked No. 4 is a compressed fang of a *dens sapientia* with a dried-up fungous enlargement at its extremity, and which occasioned a pseudo-epileptical form of fit. This was observed after some excessive excitement, and the physician who was first consulted pronounced it to be epilepsy. Each time the attack was coming on she appeared "spectre-stricken," but after the removal of the fang all the symptoms ceased, and the lady never had any return of them.

No. 6 contains some temporary teeth extracted from a young lady, *æt.* 13 or 14. She was a beautiful girl, of a sanguineous-lymphatic temperament, and she inherited a consumptive constitution. This may account for the tardiness of the dental development; for she had in the upper jaw only one permanent lateral incisor, one cuspidatus, and three bicuspidas, and, in the lower jaw, but one cuspidatus and three bicuspidas.

Nos. 10 and 11 are cases of *necrosis* of fangs; one from a blow, and the other from an active inflammation of the periosteum.

No. 17. Extracted from the mouth of

the housekeeper of the Rev. J. C—. The patient was of a nervous temperament and remarkably thin in her person, which condition arose from the constant irritation of these fangs, the cavities of which were obliterated by a bony deposit. She recovered rapidly after their removal.

No. 19. Three cases, in which the inner surfaces of the teeth are ground away by rubbing on the lower incisors, the friction having been greater from the absence of every molar tooth. There was no kind of inconvenience experienced until the pulp-cavities became exposed, and then great suffering ensued, which ceased immediately on the removal of the teeth.

No. 18. A fang of a horny appearance, which induced similar symptoms as in cases of exostosis.

No. 22. This was a curious case, which was reported at the time in the 'Lancet.'

A young lady lost her voice for many months, and was treated by counter-irritants, tonics, stimulants, and other remedial means, such as cold and warm shower baths alternately, and plunge baths, but without any benefit; and then, as a *dernier ressort*, she was sent to Brighton, where she consulted me. I observed that her teeth were wedged together, particularly those of the lower jaw, and as one of the bicuspid teeth had the appearance of being carious, I removed it, and in a few hours she recovered suddenly her voice; at first the tones were unpleasant, but ultimately they became more normal.*

No. 23. The upper part of the crown with the entire fangs absorbed. It was removed from the temporal muscle (in

* From this and other cases it is evident that when the teeth are jammed together many morbid phenomena may be observed. In Case 22 the *cordes vocales* seemed to be functionally affected. In other instances a sensation of continued tooth-ache is experienced, and which, in my own practice, I often relieved by simply using a dividing file at the parts where the pressure seemed the greatest.

which it was deeply imbedded) just at the attachment of the coronoid process. It occasioned extensive facial inflammation and great suppuration of the sub-lingual glands.

No. 15. Two cases of the "smoker's disease."* Each induced the most horrid neuralgic pains.

No. 21. Ten specimens to illustrate the irritation to the gums and sockets by the contact of sharp, rough surfaces.

No. 13. An interesting case of oblique fractures of two central incisors, occasioned by a youth who was the "blind buff" accidentally running his head against his brother's mouth, who was the taller of the two; and from the violence of the blow there was induced the above fracture.

No. 12. A case, illustrating the "smoker's disease," in which the extremities of the fangs are absorbed, and the inflammation consequent thereon is attended with darting and most excruciating agony, from the teeth being mere extraneous bodies.

No. 1. Five teeth to show the different stages of development of the fangs.

No. 2. A tooth, showing the progressive stages of development of the fangs clearly defined.

No. 14. A remarkable specimen of *exostosis*, the bony tumour being in distinct relief. This tooth was given me when I was in practice in Hull, in the year 1825, by the late Mr. Higson, the house-surgeon of the Infirmary of that town. He told me that the patient to whom it belonged was brought to the hospital with an excessive inflammation of the jaw and face, which latter extended to the eye, and subsequently induced active disease of the brain, and ultimately the death of the individual.

These are a few particulars of some of the most interesting of these cases, and, should you deem them worthy of your Journal, I shall thank you to insert them.

My object in sending these cases to the 'British Journal of Dental Science' has been merely to suggest to those who may give specimens to the museum of the Dental Hospital, that they should at the same time give a brief history of each, so that their exact value might be estimated for illustrating the different diseases of the teeth, and to distinguish those which are idiopathically affected from those which may sympathetically affect the other organs of the buccal cavity, and in time a collection might be made which would fully illustrate the

* Some years since I published, in the 'Medical Times and Gazette,' a paper on the diseases of teeth induced by smoking.

different diseased conditions of the teeth, including those which more or less may implicate remoter organs by a reflex nervous action.

DISCOLORATION OF DENTINE.

By C. A. KINGSBURY, M.D.

(From 'The Dental Cosmos,' September, 1861.)

In the 'Dental Cosmos' for June I noticed a brief article upon the above subject.

As it contained an inquiry, seconded by my friend Dr. J. Waite, on an important but hitherto much neglected point in dental practice, I felt inclined to reply to it. I was the more strongly prompted to do so, from the fact that in none of our standard works on dentistry have I, as yet, seen any treatment laid down for such cases.

Tomes, in his 'Dental Physiology,' refers to this subject, and no doubt assigns the true cause in most cases of discoloured teeth; also in his 'Dental Surgery,' in treating of necrosis, he notices the discoloration of dentine as a frequent consequence of the loss of vitality in the teeth. He also speaks of the dark stain caused by the application of nitrate of silver, to allay the exalted sensibility of dentine—but in no instance does he give a single direction for removing the discoloration and restoring the dentine in any degree to its normal shade. Indeed, he leads us to infer that, when a tooth becomes stained, either by the colouring matter of the blood permeating its dentinal tubes, or from the action of nitrate of silver or any other therapeutic agent, it is a hopeless case, and must be left to its sad fate. The works of Drs. Harris and Taft also fail to give any explicit treatment for such cases.

For many years I have felt the pre-eminent value of the natural organs over artificial ones. Acting in accordance with this conviction, I have strenuously insisted upon the preservation of teeth by filling, that my patients were disposed to sacrifice. The great objection on the part of the patient in regard to discoloration of the front teeth has been that they would not look as well as artificial teeth. It has been my aim to remove such objections by a proper course of treatment.

The attainment of this object has induced me to make many experiments, in the hope of discovering the best agents and the most successful method of treatment. Although I do not claim to have reached the "*ne plus ultra*" of my wishes in this direction, I am frequently treating cases analogous to that

one described in the 'Dental Cosmos,' with much satisfaction to my patients as well as to myself.

To illustrate my treatment, I will give a case in point, one of a number treated within the last few weeks:—

Miss P., about twenty-five years of age, desired me to examine her teeth, and perform such operations as their preservation required, calling my special attention to two of her front teeth, the superior central and lateral incisors of the left side. They were very much discoloured, and were a source of great mortification. I found them both filled with gold upon their approximal surfaces. There were clear indications that, at the time of their being filled, the decay had nearly or quite reached the pulps. The usual arsenical paste had been applied to destroy the pulps or obtund this sensibility. The teeth were then filled; soon after they assumed a reddish-brown, which changed to a slaty colour. The pulps losing their vitality while in a congested state, contained an amount of blood sufficient, when once decomposed and permeating the dentinal tubuli, to cause the discoloration of the crowns of the teeth.

I removed the fillings, and, after excavating free openings into the pulp cavities, they were syringed thoroughly with tepid water. The pulp cavities, as in almost all such cases, were filled with a dark-coloured and extremely offensive fluid. I then introduced a suitably sized brooch, having the point armed with a small pledget of cotton saturated with the tincture of iodine. This acts as a most efficient deodorizer; and while its application, repeated two or three times within as many minutes, entirely removes the fetid odour, it also acts as a powerful stimulant and local alterative, correcting any morbid condition existing in the periosteum and surrounding tissues.

My next application was a solution of cyanide of potassium. This not only removes the stain of the iodine, but it acts as a solvent of hæmatine, the colouring material of the blood globules. It also dissolves any remains of albuminous matter contained in that portion of the dentine that has lost its vitality. For some years I used spirits of ammonia for cleansing and bleaching discoloured teeth. In many cases it proved an excellent application. It is by no means equal to the solution of cyanide of potassium, for this not only acts as a solvent of hæmatine, but of almost all forms of colouring matter present in the dis-

coloured teeth; not even excepting nitrate of silver, or the metallic oxides.

When I cannot at once produce the desired change in the colour of the tooth, with this application, I have filled the cavity with moistened plaster of Paris, letting it remain from two to five days. I applied the ordinary calcined plaster of Paris in this case with good effect. I finally cleansed and filled the nerve cavities and crowns with gold, and they could scarcely be recognised as the same teeth. I invariably apply creosote to nerve cavities, as well as cavities of decay in teeth that have lost their pulps just previous to introducing the filling. I afterwards apply dry cotton or a pellet of spunk, or bibulous paper, to absorb any excess of creosote that may adhere to the parietes of the cavity. I am satisfied that the action of creosote in such cases is not only antiseptic in its nature, resisting the tendency to decay, but it gives translucency and life-like brilliancy to a tooth. In a recent conversation with Dr. W. W. Allport, of Chicago, I found that his experience in this respect corroborated my own.

In using the solution of cyanide of potassium, great care should be exercised to avoid its coming in contact with the gum, especially any abraded or wounded part of it. To prevent it from being forced through the foramina at the apex of the fangs, it is necessary to fill the nerve cavity permanently with gold, or temporarily with cotton saturated with gum sandarach dissolved in alcohol, or some similar preparation, previous to applying the cyanide. Although I have never seen the least unfavorable symptom from its use in my own practice, yet as it is one of the most active irritant poisons, the careless or excessive use of which might be attended with the most serious consequences to the patient, I feel the importance of advising caution on the part of the younger and inexperienced members of the profession, especially when I recall the serious effects produced in many cases, by the unguarded use, in years past, of arsenious acid, and other corrosive and poisonous agents. A reference to any of the standard works on materia medica, describing the properties of this powerful agent, I am sure would be sufficient to deter any one from its improper use.

The solution may be made by adding ten grains of the cyanide to a half fluid drachm of pure water; or, to make it more simple—in the absence of a proper measure—to a piece of the cyanide of the size of an ordinary buck-shot add half a teaspoonful of water.

As it decomposes in a short time, and in a great measure loses its bleaching properties, I am in the habit of preparing it at the time required, and throwing away what remains after using, in each case.

It should be applied upon a small pledget of cotton, not more than one or two drops at a time. In no case should it be left in the tooth, and the patient permitted to leave. After repeated applications, allowing the cotton to remain in the cavity five or ten minutes, warm water should be injected with considerable force from a syringe.

While acids and chloride of soda weaken and destroy the texture of the tooth, this solution possesses superior bleaching power, producing its effect in most cases immediately, without injury to the dentine. Let no one for a moment suppose that the final result can prove satisfactory without the proper use of the excavator, with due care and skill of manipulation in the subsequent operation of filling with gold.

I will only add, that I have found the above treatment to prove highly satisfactory in a large number of cases in my own practice, and I offer it to my professional brethren, hoping that if it should not fully meet their expectations in all cases, they will at least be prompted to such investigations and course of treatment as may lead to more satisfactory results.

Philadelphia;
July 27th, 1861.

AMERICAN DENTAL CONVENTION.

(Reported by GEO. T. BARKER, D.D.S.)

(From 'The Dental Cosmos,' Sept., 1861.)

ONE of the subjects taken up for discussion being "The various plastic materials for filling teeth: their relative or individual merits"—

Dr. White referred to the article published in the August number of the 'Dental Cosmos' for 1861, upon the oxychloride of zinc, as the merits of the material were honestly, though modestly enumerated. He was, at first, opposed to the use of these materials, but Dr. Metcalf had sent to him a small quantity, which he had used. In the first case, the filling, after being in eighteen months, continued sound, there being no permeation, shrinking, or cracking; in another case, where a tooth had been filled with gold without arresting decay, the oxychloride was introduced, and the

patient thought the tooth felt more comfortable, and the decay did not continue. Whenever a tooth can be filled with gold successfully, will always use it to the exclusion of other materials. A time was, when every one was disgraced who touched anything but gold, because so many had been deceived, both patients and practitioners; and he was glad that time had passed, and that there was now a disposition on the part of the profession to give all materials a fair trial. When some professor of chemistry said the oxychloride would destroy the enamel and the dentine, he took a tooth and filled it, and on examining it a month afterward, found there was not the slightest change in the dentine upon the walls of the cavity.

Dr. Wetherbee said, his faith was not as large as Dr. White's, for the material had received with him a severe blow, and justice to the profession required him to present the serious objections to its use. He referred to a case, where a dentist had introduced it in five teeth of fair quality, stating that it was better than gold, as this would not expand or contract as gold would do, on taking hot or cold articles in the mouth. After it had been in the teeth six months, he saw the case, and found three of the fillings were out, and one nearly so, while the teeth were sensitive; the decay being quite deep. The remaining one was left in, and at the end of three months it came out, leaving the cavity three times the original size. He assured the lady the material should never have been introduced, and was satisfied the osteoplastic had affected the dentine: he subsequently filled the teeth with gold. The article could not be made so that it would not absorb water, and therefore defied any one to make a water-tight filling; and had repeatedly reddened litmus-paper, and even the writing-paper in which it was rolled was discoloured from its acid.

Dr. Metcalf asked Dr. Wetherbee to what substance in the material he attributed the effect upon the dentine?

Dr. Wetherbee replied, he thought it due to the *oxide of zinc*.

Dr. Metcalf said that, so far as his knowledge of chemistry went, oxide of zinc exerted no action upon the dental structures; about the chloride he was not so positive, but when these were combined, as in the oxychloride, the mixture was perfectly harmless. This was also the view of Prof. Silliman, to whom he

had applied when first manufacturing the article. If it was properly made, it would not absorb water; and though he did not consider it would take the place of gold, thought, in some cases, it would be of use. The practice of a dentist should be "eclectic," as what may be invaluable in one case, may be useless in another.

Dr. Whitney asked Prof. Barker for some light upon the chemistry of these substances.

Prof. Barker replied that whatever of knowledge he possessed on the subject was theoretical more than practical. From the mode of manufacture given in the 'Dental Cosmos,' he should doubt very much such a thorough combination of the oxide and chloride in the manner of preparation indicated, as would entitle the substance to the name "oxychloride." The oxide of zinc is perfectly inert, and would not be injurious as a filling. The chloride is an active agent, zinc hardly neutralizing the chlorine more than did hydrogen. Chloride of zinc is the material used as a soldering fluid by braziers, to dissolve the scale of oxide and render the metal bright for the union of the solder. Judging from its active properties, he thought its action would be decidedly injurious to teeth. From Dr. Wetherbee's statement that the osteoplastic had an acid reaction, he inferred that the mixture was not made in just the proportions to insure no excess of its components.

Dr. White said, he was probably the first in this country to use chloride of zinc. He placed a tooth in a solution of chloride of zinc for three years, and he thought it was rather improved when it came out, though it was sound enough before. If the chloride removes the animal matter, this is what we want to get at. He used to be told that sugar was bad for the teeth, but since he grew older he had seen its falsity, and even had incorporated it in a dentifrice, for the sake of its grit.

Prof. Barker stated that in justice to Dr. Metcalf he ought to state that oxychloride of zinc, if properly made, would not, in his opinion, injure the teeth. He said that he supposed the action of sugar was due to its fermentation, whereby it became converted into acetic acid, which would act on the lime salts of the bone. The relative hardness of enamel, dentine, cementum, &c., would cause the action of corrosive agents to vary immensely.

Dr. Mallet entered his protest against its use.

Dr. Stephens thought it useful, if it would save teeth that could not otherwise be saved; but too much should not be claimed for it; too many in the community held it up as better than gold for filling. Dr. Metcalf was too honest to offer any article which was not in his hands valuable.

Dr. Smith, of New Haven, uses it when he thinks he can save a tooth with it, that could not be filled with gold. He considered Dr. Metcalf's preparation the best one, and had used it with good results.

Dr. Roberts believed it to be of value where teeth were exceedingly frail, not of course equal to gold, but its advantage was that it could be introduced where gold could not. It was the duty of the dentist to use what was the best material for the individual case, and his judgment must determine that. He related a case in his own mouth, where a gold filling was unsuccessful, and a bone filling subsequently introduced perfectly preserved the tooth.

Dr. Hayes asked Prof. Barker if a decomposition could not take place between the oxychloride of zinc and the phosphate of lime in the teeth.

Prof. Barker replied that we have no evidence that such a change did occur. But even if it did, the interchange of elements would break up the arrangement, and so disintegrate the tooth.

Dr. Buckingham had experimented with the different plastic materials, and found them composed of nearly the same chemical constituents. The great difficulty in manufacturing it was to obtain a uniform result, sometimes producing a substance as hard as a stone, and in others it would fail to harden, owing to impurities in the oxide of zinc; again, if the chloride be in excess it will be constantly tasted, the animal matter of the tooth will be destroyed, and the filling will fail. The fluids of the mouth vary, and in some cases will be acted upon more than others. He, therefore, in view of these objections, preferred to use some other material, though he would take issue with Dr. Wetherbee as to his objections, which might as well be urged against arsenic and numberless other articles of the U.S. Pharmacopœia; indeed the objection had been urged to arsenic being placed there because its indiscriminate use would be disadvantageous. He had used the oxy-

chloride as a temporary filling to remove the sensitiveness of dentine with good results, leaving it in from one day to two weeks.

RULES FOR GUIDANCE IN CHLOROFORM ACCIDENTS.

(From the 'Medical Times and Gazette,'
Oct. 5th, 1861.)

To the Editor of the 'Medical Times and Gazette.'

SIR,—I would wish, with your permission, to make three or four remarks on the two very remarkable instances of death from chloroform recorded in the last number of your very valuable Journal; they seem to me typical cases of the two somewhat different forms of accident from this agent.

There are obviously two, if not three forms of death from anæsthetics; but none of them, what is generally known as "cardiac syncope." The object of my paper at Manchester, was to describe, as it appears to me, the death by apnoea, from rigidity or fixture of the diaphragm and respiratory muscles, so ably elucidated by Lallemand, Perrin, and Duroy, on animals. But I rather incline to agree with Professor Simpson, that hospital experience bring us into familiarity with another sort of accident, also, in man, partly due to idiosyncrasy and mental emotion as well as to certain operations on tendons, and curiously enough on the urethra, namely, sudden death from simple syncope, or, as the French term it, "*Sidention*." The cases last week illustrate the two varieties. The third form of accident is that under ether, slow exhaustion, hebetude, extreme muscular relaxation, leading possibly to secondary hæmorrhage after amputations, &c. The pulse intermits in a marked manner under ether but not under chloroform. There is also diminution of blood corpuscles and plastic force of the blood from ether; it is about one third safer than chloroform; and is, perhaps, only advisable where we want great muscular relaxation, viz., in reduction of dislocations, hernia, &c., but not where we have to fear secondary hæmorrhage.

I have been asked to put on paper a few of the leading practical points to guide administrators of chloroform, I think, with the wide circulation your Journal

possesses in the hospitals, it would be desirable to do so through its means.

I am, &c.

CHARLES KIDD, M.D.

Sackville Street;
October, 1861.

I. Young patients, up to fifteen, and females bear chloroform best; there seems a general "tolerance" of chloroform in large surgical operations, probably from the hæmorrhage keeping the blood moving and preventing engorgement of the cavities of the heart; in females the reflex system is more active than in males.

II. Anæsthesia under chloroform is not at all of the nature of imperfect oxygenation of the blood. But this imperfect oxygenation may be superadded and run parallel with anæsthesia, leading to fainting fits after the administration; this is shown also by the plunging or violent efforts of the patient, from black blood in the muscles: even fresh concentrated vapour, from fresh additions to the inhaler, increases these muscular efforts, and always suggest the necessity of more air to the patient.

III. Where simple syncope is feared from fright, it is well to postpone the operation for a week, feeding the patient during this interval on meat and wine; the latter strengthens the muscles of the heart; it is well to bring such a patient under the chloroform, too, in a quiet ward rather than in the excitement of the operating-theatre.

IV. A passive, fixed, starting forward of the eyes, sudden contraction of the pupil, probably from spasm of the fifth nerve, and sudden change of the countenance, are the first signs of danger; the pulse may remain unchanged; chloroform should be kept warm (100° F.); this prevents coughing, which is also a dangerous symptom.

V. Simple syncope is much more dangerous than apnoea; it occurs, however, less frequently.

VI. The operations where nearly all the accidents have occurred have been those for removal of toe-nails, dead phalanges, tooth-drawing, strabismus, &c., operations on testis, reduction of dislocations,—all more or less connected with tendinous tissues.

VII. The right side of the heart, in apnoea cases, continues to beat long after the pulse stops. Probably while the iris of the patient contracts on approach of

light we have a fair chance of waking up the entire heart; the right side of the heart will beat twelve or sixteen hours after the pulse at the wrist. Faradisation of the phrenic nerve or spine will set the heart in full action in animals through the renewed action of the respiratory muscles. Pulling out the tongue by forceps, so common hitherto in accidents, is a mistake; irritation of the nerves of deglutition stops the diaphragm.

VIII. Of 125 deaths, 54 occurred immediately before operation; 42 during small operations (syncope?); 25 from ether. The number of males in all returns seems to be exactly double that of females, though chloroform has been used in at least 30,000 cases of midwifery, and syncope is common in females. This leads to a suspicion that the deaths from chloroform are like railway accidents in the management of cases.

IX. Vomiting, as in cataract cases, is best prevented by an aleotic purgative beforehand an hour or two; the stomach also to be empty at the time of operating, and the chloroform pushed well to deep anaesthesia.

X. The "cardiac syncope" of Snow is partly a post-mortem change. These are all cases of apnoea, or where the mischief arises essentially from fixture of the diaphragm. The heart, in fact, pulsates longer than the lung will receive or return the blood—hence the congestion, increased also by the efforts made at resuscitation by the surgeon himself.

XI. As to resuscitation, the means adopted at first should be as gentle as possible; a candle-wick gone out is to be blown in, not smothered by the *nimia diligentia*. Fanning the patient with cold

fresh air is first in importance; the hands dabbed with cold water, which has a powerful influence in exciting the brachial and heart nerves. Too-much cold water is not advisable. The patient should be brought at once into the open air, if summer, or into a very warm room, if winter; turned on his right side; the soles of the feet and interior of the ear tickled with a pen; his left arm held up, smacked with a wet towel, and that axilla and side of chest dashed with cold water; then artificial respiration tried by "up and down" pressure rather than "rotations." Two or three needles next stuck where the omohyoid lies at the outer edge of the sternomastoid, so as to hit off, if possible, the phrenic nerve; then the *moist* pole of a faradisation apparatus tried over the part, or along the spine; the other pole inserted under the floating ribs.

XII. It is probable, in the milder cases, the previous measures will succeed, especially in the instances of apnoea; but if, after five minutes' trial, little progress is made, then tracheotomy is to be done, and a small tube (a No. 10 india-rubber catheter) passed, and air blown gently into the lungs, (a large tube causes emphysema). Some ammonia and warm water should be thrown into the rectum. In syncope cases, transfusion into a vein of warm water with a little soda in it may wake up the heart. In apnoea (asphyxia as regards the heart, the right cavities gorged), opening a vein is useful. These measures should be continued for at least four or six hours, the body kept warm by hot blankets in a semi-recumbent position, the battery, gases, and impure air of a crowd of students rigidly excluded; pure oxygen gas also to be avoided.

Mechanical Dentistry.

A CATALOGUE OF ARTIFICIAL TEETH AND DENTAL MATERIALS, MANUFACTURED AND SOLD BY CLAUDIUS ASH AND SONS.

IN noticing this catalogue we are not actuated by a spirit of partiality or unfairness. It is neither our wish nor our business to give special prominence to any

particular house of business; but in the present day, when it is the object of every enlightened member of our calling to contribute to the improvement of our appliances, and to avail himself of the improvements of others—we cannot easily overestimate the importance of that spirit of enterprise which leads the makers and vendors of such things to adopt, carry out, and make accessible to the profession gene-

rally, such improvements as may be from time to time suggested to them.

So far as this supplying of appliances is concerned, we have long felt that the dental depôts are important channels through which the education of the rising generation of dentists must in part be carried on. Wherever this enterprise is seen, it becomes the pleasure, as well as the duty of all to recognise it, to cherish, and, as far as possible, to direct it for the common good. This is not to be done, however, by vague, immature, and fanciful ideas, but by furnishing contrivances of *well-tried, needed, and unquestionable utility*.

The proprietors of the dental depôts have lately evinced a special readiness to meet in every way the requirements of the practitioner, and the catalogue of Messrs. Ash is one of the several proofs of this disposition and of the enterprise we have alluded to. We congratulate that firm on the production of a work which, in the matter, the arrangement, the number and beauty of the illustrations, the size, type, printing, cover, &c., is characterised by extreme carefulness, skill, and good taste—a work which cannot but be most useful and acceptable to the profession, as a book of reference such as we have not before had.

Each department of dental practice,—the operating room, the laboratory, and the study, is well represented in the several lists and engravings of materials and appliances adapted to each, and it was our intention to have noticed one or two of the latter which seem to deserve the special attention of the profession, but upon attempting to fulfil this intention we find ourselves stopped by the difficulty of selection.

The improvement that has taken place, or rather, is taking place, in the *form* of mineral teeth, is, however, of such importance that we cannot pass it over. The texture and “finish” of the teeth of English manufacture have received much attention; so that in these respects there appears but little room for further improvement; indeed, we consider that the “finish” is carried already to excess; whereas, in respect of form, we have until lately made no advance, and even for the change that is at length taking place we are indebted to the zeal and the example of our transatlantic brethren. We have for many years been confined to the use of teeth so unlike the natural organs, so formal, so *unliving*, and so apparently fused into unnatural continuity, as to be detectable as artificial at any distance within half a mile.

Several of our manufacturers, and Messrs. Ash amongst the number, have, however, broken through the established bad taste, so that we now have teeth of an improved type—teeth that bear a much closer resemblance, and, in some instances, a *perfect* resemblance to the natural teeth. But further improvement is called for: as yet the change for the better relates only to the flat or vulcanite teeth:—why is this? Why should we not have tube teeth after the same model? They are greatly wanted, and we trust that we shall ere long have the want fully supplied.

RUTTERFORD AND CO.'S PORCELAIN IMPRESSION TRAYS.

It is a source of much pleasure for us to be enabled to notice, in complimentary terms, some new inventions lately introduced by Mr. Rutterford, who, though known to and respected by most of us for many years, has only lately commenced supplying the profession with dental materials; and if we may infer from the manner in which he has so zealously commenced catering for our wants, we have every reason to wish him all the success to which his ability, perseverance, and straightforwardness entitle him; and as it is our duty to notice any improvements calculated, in our opinion, to facilitate us in our operations, we with pleasure give praise to whomsoever may seem to us to merit it.

Rutterford and Co.'s Porcelain Impression Trays—the subject of these remarks—remedy at once the great inconvenience to which we have all been put, from the difficulty of having our trays kept sufficiently clean, a difficulty not easily got over with the ordinary metal ones, and even silver is open to the same objection, and must convey to our patients unpleasant thoughts with regard to their antecedents. With the porcelain trays we have all that is desirable, viz., cleanliness, strength, and beauty. The shapes are numerous and excellent, and the colours to suit any taste; and, moreover, he undertakes to make them to any design. Our wonder is that we have not had them before. To the objections which we have heard made, that pupils and assistants will be apt to break these trays in rattling them on the board to shake down plaster, we would reply that such treatment so bruises the metal trays as to make them soon unfit

for use by their roughness and consequently often dirty appearance.

Rutterford's Gutta-Percha Racks call for our next notice. We confess to having wondered at first what they were for, but were soon impressed with the knowledge of the various uses to which these racks can be applied. They are, as the name states, gutta percha, and are made in this form, *J*, in lengths of two feet or so, varnished so as closely to imitate different veneers. The object of them is to enable the practitioner to readily adjust his instrument to suit his convenience, by cutting a length of the rack to fit the drawer, and then cutting with a penknife a place in it upon which the instrument is to rest. The material being easily cut, a drawer full of instruments may be quickly arranged to suit our own wants, instead of having them in confusion, which we are compelled to acknowledge is too often the case.

ON HARDENING AND TEMPERING STEEL.

(Continued from page 235.)

SECTION IV.—*Less common examples of hardening, and precautionary measures.*

ONE of the most serious evils in hardening steel, especially in thick blocks, or those which are unequally thick and thin, is their liability to crack, from the sudden transition; and in reference to hardening razors, a case in point, Mr. Stodart mentions it as the observation and practice of one of his workmen, "that the charcoal fire should be made up with shavings of leather;" and upon being asked what good he supposed the leather could do, this workman replied, "that he could take upon him to say that he never had a razor crack in the hardening since he had used this method, though it was a frequent occurrence before."

"When," says Mr. Stodart, "brittle substances crack in cooling, it always happens from the outside contracting and becoming too small to contain the interior parts. But it is known that hard steel occupies more space than when soft; and it may easily be inferred that the nearer the steel approaches to the state of iron, the less will be this increase of dimensions. If, then, we suppose a razor, or any other piece of steel, to be heated in an open fire with a current of air passing through it, the external part will, by the loss of carbon, become less steely than

before; and when the whole piece comes to be hardened, the inside will be too large for the external part, which will probably crack. But if the piece of steel be wrapped up in the cementing mixture, or if the fire itself contain animal coal, and is put together so as to operate in the manner of that mixture, the external part, instead of being degraded by this heat, will be more carbonated than the internal part, in consequence of which it will be so far from splitting or bursting during its cooling, that it will be acted upon in a contrary direction, tending to render it more dense and solid.

"The cracking which so often occurs on the immersion of steel articles in water does not appear to arise so much from any decarbonization of the surface merely, as from the sudden condensation and contraction of a superficial portion of the metal, while the mass inside remains swelled with the heat, and probably expands for a moment, on the outside coming in contact with the water."

The file-makers, to save their works from *clinking* or cracking partly through in hardening, draw the files through yeast, beer grounds, or any sticky material, and then through a mixture of common salt and animal hoof, roasted and pounded. This is corroborative of the above, as in the like manner it supplies a little carbon to the outside, and also renders the steel somewhat harder and less disposed to crack; the composition also renders the more important service of protecting the fine points of the teeth from being injured by the fire.

An analogous method is now practised in hardening Jones's patent axletrees, which are of wrought iron, with two pieces of steel welded into the lower side, where they rest upon the wheels and sustain the load. The work is heated in an open forge fire, quite in the ordinary way, and when it is removed, a mixture, principally the prussiate of potash, is laid upon the steel; the axletree is then immediately immersed in water, and additional water is allowed to fall upon it from a cistern. The steel is considered to become very materially harder for the treatment, and the iron around the same is also partially hardened.*

* These axletrees are used for Jones's patent wrought-iron suspension wheels, which have iron naves made of chilled castings; to the prussiate is added one third of the carbonate of ammonia; the effect of the carbonate is principally considered to be the more minute subdivision of the prussiate over the surface of the steel.

These are, in fact, applications of the case-hardening process, which is usually applied to wrought iron for giving it a steely exterior, as the name very properly implies. Occasionally, steel which hardens but imperfectly, either from an original defect in the material, or from its having become deteriorated by bad treatment, or too frequent passage through the fire, is submitted to the case-hardening process in the ordinary way, by inclosing the objects in iron boxes, as will be explained. This in part restores the carbon which has been lost, and the steel admits of being hardened; but this practice is not to be generally recommended, although it is well employed for the purposes of transfer engraving explained at foot; a method introduced by Mr. Jacob Perkins, and which took its origin in the curious transfer processes of the calico works, wherein however copper is the material principally used.*

* Mr. Perkins's admirable process of transfer engraving may be thus explained. A soft steel plate was first engraved with the required subject in the most finished style of art, either by hand or mechanically, or the two combined, and the plate was then hardened. A decarbonized steel cylinder was next rolled over the hardened plate by powerful machinery, until the engraved impression appeared in relief, the hollow lines of the original becoming ridges upon the cylinder. The roller was reconverted to the condition of ordinary steel and hardened, after which it served for returning the impression to any number of decarbonized plates, every one of which became absolutely a *counterpart* of the original; and every plate when hardened would yield the enormous number of 150,000 impressions without any perceptible difference between the first and the last.

In the event of any accident occurring to the transfer roller, the original plate still existed, from which another or any required number of rollers could be made, and from these rollers any number of new plates, all capable of producing as many impressions as above cited.

Specimens of Mr. Perkins's process may be seen in the 38th volume of the 'Transactions of the Society of Arts;' and it is there stated by the inventor, that to decarbonise the plates they were placed in the vertical position in cast-iron boxes not less than three quarters of an inch thick, and surrounded on all sides by a stratum of iron filings not less than half an inch thick; the boxes were then placed in a furnace, and after having been heated, were suffered to cool in the most gradual manner by stopping off all the air-passages and covering the boxes with a layer of cinders six or seven inches deep. The reconversion was similarly accomplished, but with the charcoal from leather sifted fine, and on removal from the boxes at the end of from three to five hours the plates were immediately plunged vertically into cold water.

The late Mr. Warren was instrumental in bringing into common use the thin steel plates, similar

Various methods have been likewise attempted to prevent the distortions to which work is liable in the operation of

to those previously used for copper; these were annealed at a higher temperature, in earthenware boxes filled with pounded oyster-shells.—See 'Trans. Soc. of Arts,' vol. xli, p. 88.

The practice at the Bank of England, introduced by the late Mr. John Oldham, and followed under the superintendence of his son, Mr. Thomas Oldham, is to anneal at one time four cast-iron boxes, each containing from three to six steel plates, surrounded on all sides with fine charcoal, mixed with an equal quantity of chalk, and driven in hard.

The reverberatory furnace employed has a circular cast-iron plate or bed, upon which the four boxes are fastened by wedges, and as the plate revolves very slowly and continually by the steam engine employed in working the printing presses and other machinery, the plates are exposed in the most equal manner to the heat, and when the proper temperature is attained, all the apertures are carefully closed and luted to extend the cooling over a space of at least forty-eight hours.

The surfaces of the cylinders and plates are thus rendered exceedingly soft, to the depth of about the thirty-second of an inch, "so as to become more like lead than anything else," and thus much of their surfaces must be turned or planed off; the device is raised in the transfer-press upon the natural soft steel of the rollers, under a pressure of some tons, and these are hardened without any intentional application of the case-hardening process, as the simple steel is undoubtedly very superior in all respects to that which has been decarbonized and reconverted.

The plates themselves are used in the soft state, as they then admit of reparation by the transfer rollers; and the process is found to be more economical, as the risk of warping is avoided, and they may be easily repaired. The dates and numbers are at present printed as a second process by letter-press printing, with the machines invented by the late Mr. Bramah, and which have been engraved and described in different books.

In hardening engraved plates, rollers, dies, and similar works, it is of the greatest importance to preserve the surface unimpaired; and as steel is very liable to oxidation at the red heat if exposed to the air for even a few seconds, and which oxidized scale will in some cases nearly remove, or at any rate injure, the subject produced upon its surface, it is of great importance to conduct the heating and cooling with the most complete exclusion of the air.

Mr. Thomas Oldham introduced a mode of hardening the transfer rollers, which appears as near to perfection as possible, and by it, instead of the works acquiring the ordinary black and gray tints, and a minute roughness, like the surface of the finest emery paper, the steel comes out of the water as smooth to the touch as at first, and mottled with all the beautiful tints seen on case-hardened gunlocks. The method is simply as follows:

The work to be hardened is enclosed in a wrought-iron box with a loose cover, a false bottom, and with three ears projecting from its surface about midway; the steel is surrounded on all sides with carbon from leather, driven in hard, and the cover and bottom are carefully luted with moist clay. Thus prepared, the case is placed in the vertical

hardening, but without any very advantageous results; for instance, it has been recommended to harden small cylindrical wires, by rolling them when heated between cold metallic surfaces, to retain them perfectly straight. This might probably answer, but unfortunately cylindrical steel wires supply but a very insignificant portion of our wants.

Another mode tried by Dr. Wollaston was to enclose the piece of steel in a tube filled with Newton's fusible alloy, the whole to be heated to redness and plunged in cold water; the object was released by immersion in boiling water, which melted the alloy, and the piece came out perfectly unaltered in form, and quite hard. This mode is too circuitous for common practice, and the reason why it is to be always successful is not very apparent.

Mr. Perkins resorted to a very simple practice with the view of lessening the distortion of his engraved steel plates, by boiling the water in which they were to be hardened to drive off the air, and plunging them vertically; and as the plates were required to be tempered to a straw colour, instead of allowing them to remain in the water until entirely cold, he removed them whilst the inside was still hot, and placed them on the top of a

position, in a bridle fixed across a great tub, which is then filled with water almost to touch the false bottom of the case. The latter is now heated in the furnace as quickly as will allow the uniform penetration of the heat.

When sufficiently hot it is removed to its place in the hardening tub, the cover of the iron box is removed, and the neck or gudgeon of the cylinder is grasped *beneath the surface of the carbon*, with a long pair of tongs, upon which a couplet is dropped to secure the grasp. It only remains for the individual to hold the tongs with a glove whilst a smart tap of a hammer is given on their extremity; this knocks out the false bottom of the case, and the cylinder and tongs are instantly immersed in the water; the tongs prevent the cylinder from falling on its side, and thus injuring its delicate but still hot surface. For square plates, a suitable frame is attached by four slight claws, and it is the frame which is seized by the tongs; the latter are sometimes held by a chain, which removes the risk of accident to the individual. In some cases the work assumes a striated and mackled appearance, evident to the touch as well as the sight, and which is to be attributed to an imperfect manufacture of the steel.

Mr. Oldham informed me that in the Paris Mint the dies are enclosed in the soot of burnt wood; and that in our own Mint the dies are hardened by powerful jets of water. He also added, that his workpeople have the impression that steel is reduced to its softest state by enclosure with lime and ox-gall. The reader is referred to Sir J. Robinson's note U, in the Appendix of vol. ii, page 970.

clear fire until the tallow with which they were rubbed smoked; the plate was then returned to the water for a few moments, and so on alternately until they were quite cold, the surface never being allowed to exceed the tempering heat.

From various observations, it appears on the whole to be the best in thick works thus to combine the hardening and tempering processes, instead of allowing the objects to become entirely cold, and then to re-heat them for tempering. To ascertain the time when the plate should be first removed from the water, Mr. Perkins heated a piece of steel to the straw colour, and dipped it into water to learn the sound it made; and when the hardened plate caused the *same* sound, it was considered to be cooled to the right degree, and was immediately withdrawn.*

I will conclude these numerous examples and remarks by one of a very curious, massive, and perfect kind, in which the hardening is sure to occur without loss of figure, unless the work break under the process. I refer to the locomotive wheels with hardened steel tires, patented by Mr. Daniel Gooch, and which may be viewed, as the most ponderous example of hardening, as the tires of the eight-foot wheels weigh about ten hundredweight, and consist of about one third steel, and there seems no reason why this diameter might not be greatly exceeded.

The materials for the tires are first swaged separately, and then welded together under the heavy hammer at the steel-works, after which they are bent to the circle, welded, and turned to certain gauges. The tire is now heated to redness in a circular furnace; during the time it is getting hot, the iron wheel, previously turned to the right diameter, is bolted down upon a face-plate; the tire expands with the heat, and when at a cherry-red, it is dropped over the wheel, for which it was previously too small, and is also hastily bolted down to the surface plate, the whole load is quickly immersed by a swing crane into a tank of water about five feet deep, and hauled up and down until nearly cold; the steel tires are not afterwards tempered.†

SECTION V.—*Hardening and Softening Cast Iron.*

The similitude of chemical constitution

* 'Trans. Soc. of Arts,' vol. xxxviii, p. 55.

† The patentees consider the steel tires to be

between steel, which usually contains about one per cent. of carbon, and cast iron that has from three to six or seven per cent., naturally leads to the expectation of some correspondence in their characters, and which is found to exist. Thus some kinds of cast iron will harden almost like steel, but they generally require a higher temperature; and the majority of cast iron, also like steel, assumes different degrees of hardness, according to the rapidity with which the pieces are allowed to cool.

The casting left undisturbed in the mould is softer than a similar one exposed to the air soon after it has been poured. Large castings cannot cool very hastily, and are seldom so hard as the small pieces, some of which are hardened like steel by the moisture combined with the moulding sand, and cannot be filed until they have been annealed after the manner of steel, which renders them soft and easy to be worked.

Chilled iron castings present as difficult a problem as the hardening and tempering of steel; the fact is simply this, that iron castings, made in iron moulds under particular circumstances, become on their outer surfaces perfectly hard, and resist the file almost like hardened steel; the effect is however superficial, as the chilled exterior shows a distinct line of demarcation when the objects are broken.

The late Mr. Ransome, of Ipswich, took out a patent in 1803, for ploughshares cast on this principle: the under sides and points are hard from the chilling process, and these, from resisting abrasion more than the softer parts, maintain a comparatively thin edge;—an imitation of the

eight times harder than those of wrought-iron, and to be proportionately durable, and from the very ingenious method employed in their construction they are little exposed to accident. The spokes are forged out of flat bars with T-formed heads; these are arranged radially in the founder's mould, whilst the cast-iron centre is poured around them; the ends of the T-heads are then welded together to constitute the periphery of the wheel or inner tire, and little wedge-form pieces are inserted where there is any deficiency of iron.

The wheel is then chucked on a lathe, bored, and turned on the edge, not cylindrically, but like the meeting of two cones, and about one quarter of an inch higher in the middle than on the two edges. The compound tire is turned to the corresponding form, and consequently larger within or under-cut, so that the shrinking secures the tire without the possibility of obliquity or derangement, and no rivets are required. It sometimes happens that the tire breaks in shrinking when by mismanagement the diameter of the wheel is in excess.

beautiful provision in nature for preserving the acute edges of the front teeth of the rat, squirrel, and other rodentia, the external enamel of which is always left in advance from the wearing away of the softer bone or ivory beneath, and acts almost in the manner of a carpenter's chisel.

The production of chilled castings is always a matter of some uncertainty, and depends upon the united effect of several causes; the quality of the iron, the thickness of the casting, the temperature of the iron at the time of pouring, and the condition or temperature of the iron mould, which has a greater effect in "striking in" when the mould is heated than if quite cold: a very thin stratum of earthy matter will almost entirely obviate the chilling effect.*

Mr. May, a member of the present firm, has furnished me with specimens of chilling, in which the hard portion varies from less than one sixteenth to more than one fourth of an inch in thickness: he considers it to be an effect of crystallization, and conjectures that the tendency to chill properly will be found to depend upon the due atomic proportions of carbon and iron, combined with the circumstances before alluded to.

There is this remarkable difference between cast iron thus hardened and steel hardened by plunging, whilst hot, into water; that whereas the latter is softened again by a dull red heat, the chilled castings, on the contrary, are turned out of the moulds as soon as the metal is set, and are allowed to cool in the air; yet although the whole is at a bright red heat, no softening of the chilled part takes place. This material was employed by the late Mr. Peter Keir for punches for red-hot iron; the punches were fixed in cast-iron sockets, from which they only projected sufficiently to perforate the wheel tires in the formation of which they were used, and from retaining their hardness they were more efficient than those punches made of steel.

Chilled castings are also commonly employed for axletree boxes and naves of wheels, which are finished by grinding only; also for cylinders for rolling metal, for the heavy hammers and anvils or stithies for iron works, the stamp heads for

* A cold mould does not generally chill so readily as one heated nearly to the extent called "black-hot;" but the reverse conditions occur with some cast-iron.

pounding metallic ores, &c. Cannon balls, as well as ploughshares, are examples of chilled castings; with the destructive engine the chilling is unimportant, and occurs alone from the method essential to giving the balls the required perfection of form and size.

Malleable iron castings are at the opposite extreme of the scale, and are rendered externally *soft* by the abstraction of their carbon; whereby they are nearly reduced to the condition of pure malleable iron, but without the fibre which is due to the hammering and rolling employed at the forge.

The malleable iron castings are made from the rich Cumberland iron, and are at first as brittle as glass or hardened steel; they are enclosed in iron boxes of suitable size, and surrounded with pounded iron-stone, or some of the metallic oxides, as the scales from the iron forge, or with common lime, and various other absorbents of carbon, used either together or separately. The cases, which are sometimes as large as barrels, are luted, rolled into the ovens or furnaces, and submitted to a good heat for about five days, and are then allowed to cool very gradually within the furnaces.

The time and other circumstances determine the depth of the effect; thin pieces become malleable entirely through; they are then readily bent, and may be slightly forged; cast-iron nails and tacks thus treated admit of being clenched, thicker pieces retain a central portion of cast iron, but in a softened state, and not brittle as at first, on sawing them through, the skin or coat of soft iron is perfectly distinct from the remainder.

The mode is particularly useful for thin articles that can be more economically and correctly cast, than wrought at the forge, as bridle-bits, snuffers, parts of locks, culinary and other vessels, pokers and tongs, many of which are subsequently case-hardened and polished, as will be explained, but malleable cast iron should never be used for cutting-tools.

SECTION VI.—*Case-hardening Wrought and Cast Iron.*

The property of hardening is not possessed by pure malleable iron; but I have now to explain a rapid and partial process of cementation, by which wrought iron is first converted exteriorly into steel, and

is subsequently hardened to that particular depth, leaving the central parts in their original condition of soft fibrous iron. The process is very consistently called *case-hardening*, and is of great importance in the mechanical arts, as the pieces combine the economy, strength, and internal flexibility of iron, with a thin casing of steel, which, although admirable as an armour of defence from wear or deterioration as regards the surface, is unfit for the formation of cutting edges or tools, owing to the entire absence of hammering, subsequent to the cementation with the carbon. Cast iron obtains in like manner a coating of steel, which surrounds the peculiar shape the metal may have assumed in the iron-foundry and workshop.

The principal agents used for case-hardening are animal matters, as the hoofs, horns, bones, and skins of animals; these are nearly alike in chemical constitution; they are mostly charred and coarsely pounded: some persons also mix a little common salt with some of the above; the works should be surrounded on all sides with a layer from half an inch to one inch thick.

The methods pursued by different individuals do not greatly differ; for example, the gunsmith inserts the iron work of the gun-lock in a sheet-iron case in the midst of a partially charred bone-dust; the lid of the box is tied on with iron wire, and the joint is luted with clay; it is then slowly heated to redness; and retained at that heat from half an hour to an hour, and the contents are immersed in cold water as quickly as possible, to prevent the access of air. The objects sought are a steely exterior and a clean surface covered with the pretty mottled tints, apparently caused by oxidation from the partial admission of air.

Some of the malleable iron castings, such as snuffers, are case-hardened, to admit of a better polish; it is usually done with burnt bone-dust, and at a dull red heat; they remain in the fire about two or three hours, and should be immersed in oil, as it does not render them quite so brittle as when plunged into water. It must be remembered they are sometimes changed throughout their substance into an inferior kind of steel, by a process that should in such instances be called cementation, and not *case-hardening*, consequently they will not endure violence.

The mechanic and engineer use horns, hoofs, bone-dust, and leather, and allow the period to extend from two to eight hours, most generally four or five; sometimes, for its greater penetration, the process is repeated a second time with new carbonaceous materials. Some open the box and immerse the work in water direct from the furnace; others, with the view to preserve a better surface, allow the box to cool without being opened, and harden the pieces with the open fire as a subsequent operation; the carbon once added, the work may be annealed and hardened much the same as ordinary steel.

When the case-hardening is required to terminate at any particular part, as a shoulder, the object is left with a band or projection; the work is allowed to cool without being immersed in water, the band is turned off, and the work when hardened in the open fire is only affected so far as the original cemented surface remains. This ingenious method was introduced by Mr. Roberts, of Manchester, who considers the success of the case-hardening process to depend on the gentle application of the heat; and that, by proper management not to overheat the work, it may be made to penetrate three eighths of an inch in four or five hours.

A new substance for the case-hardening process, but containing the same elements as those more commonly employed, has of late years been added, namely, the prussiate of potash (a salt consisting of two atoms of carbon and one of nitrogen), which is made from a variety of animal matters.

It is a new application without any change of principle; the time occupied in this steelifying process is sometimes only minutes instead of hours and days, as for example when iron is heated in the open fire to a dull red, and the prussiate is either sprinkled upon it or rubbed on in the lump, it is returned to the fire for a few minutes and immersed in water; but the process is then exceedingly superficial, and it may if needful be limited to any particular part upon which alone the prussiate is applied. The effect by many is thought to be partial or in spots, as if the salt refused to act uniformly, in the same manner that water only moistens a greasy surface in places.

The prussiate of potash has been used for case-hardening the bearings of wrought-iron shafts, but this seems scarcely worth

the doing: it has been also employed with the view of giving an additional and extreme, although superficial, hardness to steel, as in Jones's axletrees, Perkins's engraved steel plates, &c., but I have only heard of one individual who has encased work with this salt, it was for case-hardening the iron rollers and side-plates of glaziers' vices employed for milling window-lead.

In the general way, the conversion of the iron into steel, by case-hardening, is quite superficial, and does not exceed the sixteenth of an inch; if made to extend to one quarter or three eighths of an inch in depth, to say the least it would be generally useless, as the object is to obtain durability of surface, with strength of interior, and this would disproportionately encroach on the strong iron within. The steel obtained in this adventitious manner is not equal in strength to that converted and hammered in the usual way, and if sent in so deeply, the provision for wear would far exceed that which is required.

Let us compare the case-hardening process with the usual conversion of steel. The latter requires a period of about seven days, and a very pure carbon, namely wood charcoal, of which a minute portion only is absorbed; and it being a simple body, when the access of air is prevented by the proper security of the troughs, the bulk of the charcoal remains unconsumed, and is reserved for future use, as it has undergone no change. The hasty and partial process of cementation is produced in a period commonly less than as many hours with the animal charcoal, or than as many minutes with the prussiate of potash; but all these are compound bodies (which contain cyanogen, a body consisting of carbon and nitrogen), and are never used a second time, but, on the contrary, the process is often repeated with another dose. It would be, therefore, an interesting inquiry for the chemist, as to whether the cyanogen is absorbed after the same manner as carbon in ordinary steel (and which in Mackintosh's patent process was driven through the crucible in the form of carbonic acid gas, and is stated to be absorbed at the rate of one thirtieth of an inch in depth, each hour); or whether the nitrogen assists in any way in hastening the admission of the carbon, by some as yet untraced affinity or decomposition.*

* It may happen that the carbon is not essential,

This hasty supposition will apply less easily to cast iron, which contains from three to seven times as much carbon as steel, and although not always hardened by simple immersion, is constantly under the influence of the case-hardening process; unless we adopt the supposition that the carbon in cast iron which is mixed with the metal in the shape of cinder in the blast furnace, when all is in a fluid state, is in a less refined union than that instilled in a more æriform condition in the acts of cementation and case-hardening.*

DENTAL PATENTS.

By GEORGE OWEN.

(Continued from page 239.)

ERRATUM.—In the last number, page 238, line 12, for "February 15th, 1863," read "August 15th, 1862."

THE NEW PATENT LAWS.

It has already been intimated that in October, 1852, important changes in the law of patents in this country came into operation; and as we have arrived at that period in the prosecution of our present design, it is necessary that I should state briefly the nature of those changes, but so far only as they are necessary to be known and taken account of in judging of the value of a patent-right, or of a licence to use any of the contrivances referred to in those patents which we have now to notice.

An inventor is no longer obliged, as formerly, to expend several hundred pounds in one sum, in order to secure to himself the exclusive use of his contrivance during a term of fourteen years, a separate patent being required for Ireland, Scotland, &c.,

as the Indian steel or wootz is stated to contain alumine and silic; and manganese is used in Heath's and Vicker's patents.

* It would have been an easy task to have multiplied the examples and remarks upon these curious subjects of hardening and tempering, which have already far, very far, exceeded the intended limits. The reader will find much useful matter upon the same in 'Lardner's Cyclopædia,' in the volume on Iron and Steel, and in 'Gill's Technological Repository,' in each of which the subjects are perhaps treated in a more practical manner than in many other works in which they are touched upon. 'The Journal of the Royal Institution,' vol. ix, p. 319 to 333, contains much curious information upon alloys of steel with silver, rhodium, platinum, nickel, &c.

each involving a large outlay of capital. He can now, by the payment of a small fee, and lodging a written statement of the nature of his invention, secure it to himself in England, Ireland, Scotland, the Channel Islands, and Isle of Man, for a space of six months; during which time he may openly experiment upon, improve, sell, or otherwise dispose of his invention, without prejudice to letters patent for the same. This is called "Provisional Protection," and the written statement "the Provisional Specification."

If, before a certain day within the six months above named, the inventor give notice of his intention to proceed with the patent, his intention is gazetted, and if no rival inventor successfully oppose his application, he may, by paying certain fees, and lodging another specification, called the "*Complete Specification*," obtain letters patent, which secure the invention to him for the term of fourteen years, **CONDITIONALLY** as follows, viz., that before the expiration of the first three years he shall pay certain additional fees, and again before the end of the seventh year certain further fees. In default of the fulfilment of any of these conditions, the protection or patent right, as the case may be, ceases from that time, and the invention is open to the world.

Thus, supposing no legal obstacle exist to prevent the issue of letters patent at the expiration of the term of provisional protection, a patentee may be considered to hold a lease of the benefits of his invention for the term of fourteen years from the date of the provisional protection, determinable at his own option at the expiration of *six months, three years, or seven years*, by non-payment of fees. An inventor has the option of paying all the fees at once, and so securing a patent for the full term, but this is rarely done. One instance only has occurred, out of more than 250,000 cases. The effect of these arrangements, and the importance of keeping them in view, are well illustrated by the following facts with respect to that class of patents which we have in review. Since these laws came into force, to September, 1860, "provisional protection" was granted in 56 cases; of these, 40 have already lapsed, viz.:

18 at the end of six months.

19 " " three years.

3 " " seven "

Of the 16 that remain in force—

1 goes on the full term of fourteen years.

2 have not reached the end of the seventh year.

13 " " " third "

Another circumstance affecting the duration of a patent may be mentioned, viz., that letters patent in this country for a patented foreign invention do not continue in force after the expiration of the foreign patent.

1852. James Anderson Young.—For certain improvements in dental operations, and in apparatus or instruments to be used therein.

EXTRACT FROM SPECIFICATION.

"My said invention relates essentially to various arrangements of mechanism, apparatus, or means for increasing the efficiency and portability of the forceps or dental instruments employed in the extraction of teeth; the essential features of my plans being: First, constructing the forceps with open heads, so as to enable the operator to see distinctly what he is doing at the teeth and roots. Second, parting the opening of the heads of the beaks at any angle with the meeting of the points, the object in most cases being that the points only should meet upon the root of the tooth; the head of the latter being free from pressure to avoid crushing, with the angle properly set, the mere pressure of the beaks will, in many cases, bring out the tooth without any pulling. Third, angling the internal concavity of the beaks so as to allow the beaks to grasp firmly any sized root by bearing upon it by four different surfaces. Fourth, bringing the beaks to a sharp angular point so that they may be easily and quickly forced between the jaw and the root, whether the latter is large or small. Fifth, making an angular or other cleft in the palatal beak of forceps for the upper molares or other beaks having the internal angled concavity, thereby bringing the beak to two sharp angular points. Sixth, constructing the beaks so as in all cases to act only on the roots, the same forceps being applicable either for teeth or roots, or children's teeth. Seventh, making the handles and bodies of the instruments all of one particular shape, the curved shape giving the operator sufficient direct pressure to fix the instrument and remove the tooth easily, whilst his vision is unobstructed. Eighth, separating the handles from the bodies, so that one pair of handles may serve any number of heads. Ninth, separating the beaks from the body of the instrument, one head or body serving any number of beaks. Tenth, certain peculiar modes of fitting the handles and beaks. Eleventh, the insertion of small screw corrugated or serrated wedges in roots where great decay has taken place to prevent crushing."

Fifty-three drawings of forceps, parts of forceps, elevators, &c., accompany this specification. The main features in which the instruments differ from the adjusted forceps in general use appear to be—

1st. In the form of the grooving of the jaws; instead of rounded grooves made to fit the necks of the teeth as accurately as possible in every part, the grooves are *angular*, as stated under the third, fourth, and fifth heads in the above extract.

2ndly. In the increased length of the instrument between the jaws and the joint.

3rdly. In the handles and beaks or jaws being separable from the body of the instrument, as under the eighth, ninth, and tenth heads.

Expired October 2nd, 1855, the end of its third year.

1852.—Bendix Ising Jacoby.—For improvements in the means of fixing artificial teeth.

EXTRACT FROM SPECIFICATION.

"The nature of my said invention, which has already been generally described in my provisional specification, bearing date the fourth day of October, one thousand eight hundred and fifty-two, consists in the use and application to the mouth of a metal plate, to which are to be affixed artificial teeth. The plate is formed with one or more recesses or air chambers for the purpose of causing adhesion of said plate by the wearer exhausting the air contained in such said chamber or chambers by suction as he places the plate in his mouth, the effect of which will be, that said plate will be forcibly pressed upwards by reason of the pressure of the air on the outer and under surface only of said plate consequent upon the partial vacuum produced in the chamber or chambers in the manner above stated. And the object and intention of my said invention is to dispense with the use of the ligatures, pins, rings, braces, and springs hitherto employed by mechanical dentists to retain artificial teeth in their proper position; and, further, by this invention to promote a quick and plain pronunciation, and prevent the adhesion of food round said air chamber or chambers during the process of mastication, and generally to facilitate the swallowing of food by making the plate of a sloping form.

So far as this invention goes, it is identical with the first part of Moggridge's patent of 1846. (See p. 236.)

Expired October 4th, 1855, at the end of three years.

1852. Ephraim Mosely.—For improvements in the manufacture of artificial masticating apparatus.

EXTRACT FROM SPECIFICATION.

"In carrying out my invention, I affix to that surface of the ordinary gold plate or frame which has heretofore been brought into contact with the gum a layer of wire gauze, for the purpose of receiving a coating of india rubber, which is to form an elastic cushion, and yield sufficiently to the pressure of the gums to prevent the occurrence of the unpleasant jarring sensation.

"In some cases it may be thought desirable to form on the gold plate an artificial gum, so that the teeth may appear to be imbedded as in nature. When this is required, I affix to the gold plate a suitably moulded perforated plate or wire gauze frame, composed of platinum or other non-oxidizable metal, and I cover this plate or frame with a pre-

paration of india rubber of the colour of the natural gum, effecting the adherence of the india rubber to the metal by means of suitable cement; or I use a coloured solution of india rubber, and apply it, by means of a camel's hair brush, to the metal gum, laying coat upon coat, until a sufficient thickness is obtained. This solution, as well as the preparation of coloured india rubber above mentioned, I produce by dissolving the india rubber in chloroform, and mixing vermilion therewith.

"When economy is an object, I propose, as a modification of the plan above set forth, to apply the coating of india rubber to a bone frame without the intervention of wire gauze. In such case, small plates of gold are set at convenient distances apart, and made to press upon the layer of india rubber, by means of gold pins passing through them and entering the bone frame, and by this means the india rubber cushion or covering is secured in its place.

"I claim, first, interposing between the gum of the wearer of artificial teeth, and the plate or frame which carries the teeth, a layer or cushion of india rubber for the purpose above set forth; and, secondly, I claim the mode above described of producing artificial gums having the appearance of the natural gum."

Lapsed December 21st, 1859, at the end of seven years.

1853. George Laurie.—For improvements in the manufacture of artificial teeth and gums.

ENTIRE SPECIFICATION.

"I construct my plates and arrange the teeth thereon in the usual manner. I rim my plates on the outer margin, and also within that portion of the plate which covers the alveolar ridge near the base of the teeth to secure more effectually the compound and give strength and finish to the denture. After the teeth are properly arranged upon the plate and wax I cover them with a mixture of plaster of Paris, two parts; sand, one part; asbestos, one part; well mixed, and water added to make it of the proper consistence for covering the teeth in the usual way. The teeth being thus covered, the wax is removed from the inside and the linings or fastenings arranged upon them; they are then soldered to the teeth with solder or pure gold; after which the plaster and asbestos covering is removed. I now place the denture in the mouth of the patient, and place wax or any other convenient substance on the outside of the plate and teeth of sufficient thickness and proper form to bring out the muscles of the face to their original degree of rotundity. From the wax or other model thus formed, upon which the muscles of the face rest, a metallic framework is constructed corresponding; this frame or bulb is then soldered to the plate and united to the teeth by covering it with the siliceous compound with which I form my artificial continuous gums. The compound I prefer is prepared in the following manner:—Silica, four ounces; borax, two ounces; felspar, one ounce; kaolin clay, one ounce; asbestos, two drachms; caustic potash, two drachms; mix these ingredients, reducing them to a fine powder, and fuse in a crucible; pulverize this material, and add the same weight of pulverized Wedgewood, Parian marble,

or porcelain tooth body; to every seven ounces of this mixture add one ounce of fine French clock shade or other glass; reduce the whole to an impalpable powder, and it will be ready for use. I mix the compound with sufficient water to bring it to a plastic state, then insert it between and round the bases of the teeth, so as to form a continuous gum, and also upon the bulb or framework before mentioned, intermixing platina shreds, wire, or gauze, to combine the toughness of the metal with the mineral. I also solder platina scraps, strips, shreds, or wire to the plate about the base of the teeth to secure a firm adhesion of the compound (to the plate) when fused, thus forming a metallic union between the teeth, gum, and plate. The gum coloured enamel is made like that usually employed on block work, with the addition of sufficient flux to cause it to flow at a lower heat, say 3.200 Fahrenheit. The compound being applied as above, and fused in the muffle of a furnace, is then withdrawn and cooled slowly. The gum or flesh coloured enamel is applied and fused in the same way.

"Having thus stated the nature of the said invention, I will proceed to describe the manner of performing the same.

"The first part of the invention consists of using asbestos in combination with sand and plaster of Paris, in place of plaster of Paris and sand alone, when covering the teeth, after they have been set in wax on a metal plate. The addition of asbestos materially improves the compound, and when subjected to heat with a view to melt the solder to fix the teeth to the metal plate, will retain its form and tend to prevent the plate getting out of its correct figure. The manner of use of the composition containing asbestos is the same as that heretofore practised when using plaster of Paris and sand without the asbestos, and will not therefore require further description.

"The second part of the invention consists of obtaining or forming the gums or parts of gums in combination with the use of a metal plate with teeth affixed thereto; such gums according to the invention being composed of a vitreous compound above described, to which compound I make no claim separately. In carrying out this part of my invention a metal plate is to be formed as heretofore, and the artificial teeth are to be fixed thereto, as has heretofore been practised, whether by the mode above described, or by soldering pins to the plate and fixing tube teeth thereon; to neither of which modes of fixing artificial teeth to a metal plate, nor to the making of the plate itself, do I make any claim. The artificial teeth I use are what are called mineral teeth, but whatever teeth be used for the purposes of this invention, they require to be such as will bear a heat sufficiently above that at which the composition for making the gums will flux and run as to ensure their not being injured by the heat applied in producing the gums on the plate and teeth. A plate and teeth having been made and combined as above explained, this part of my invention consists of forming gums on the plate, and at and around the roots or lower parts of the teeth, where they are fixed to the plate by using, by preference, the vitreous compound above described; this forming of the gums is readily performed by the hands with modelling tools; and having formed the gums with the plastic matter it is allowed to dry and to set, and then is subjected to heat, so that the vitreous enamel will

adhere to the metal plate and to the lower parts of the teeth, and will form artificial gums thereto of a very cleanly description. In applying heat care is to be taken that the raising and also the lowering the temperature be done gradually. The vitreous compound above mentioned may be varied, but I believe that which is above given to be the best for the purpose; and the same will have colouring matters mixed therewith as similar vitreous compounds heretofore have had when used in making mineral blocks sometimes called gum teeth, wherein metal plates and artificial teeth are not combined.

"Having thus described the nature of the said invention, and the manner of performing the same, I would have it understood that what I claim is, first, the use of asbestos, as herein described; and, secondly, I claim the forming of artificial gums to artificial teeth fixed to a metal plate."

Lapsed October 15th, 1856, at the end of three years.

1853. Charles William Hockaday.—For certain chemical compound or compounds, applicable as a remedy or remedies for scorbutic and other affections of the human body.

EXTRACT FROM SPECIFICATION.

"For an odontalgic tincture, I combine of acid nitros, ten drops; tinct. pyreth., twenty drops; and apply the same by means of a feather, camel hair pencil, or by any other suitable means.

"For tooth paste, I form by a mixture of the following ingredients:—test. vel cretæ pp, two drachms; pulv. irridis, two drachms; pulv. coralli, two drachms; alum exsicc., two scruples; cocci cacti, two scruples; el. caryoph., eight drops; ess. bergam., four drops; mel. rose, two ounces."

Lapsed December 2nd, 1856, at the end of three years.

1854. William Massey.—For improvements in artificial teeth and gums.

ENTIRE SPECIFICATION.

"Heretofore in the manufacture of artificial teeth and gums from mineral substances it has been usual to apply the colouring matter for the parts representing the gums only to the outer surface thereof, whilst the base or all except just the surface of the material remains white or of a light colour, and when, as is frequently the case in adapting the gums to the mouth, any portion becomes chipped or ground off, or is otherwise worn off, the colour on the surface of that part (and applied in imitation of a natural gum) is lost, and the defect is thereby made more perceptible; and my improvements consist, first, in the application of colouring or staining matter throughout the entire mass or substance of which such artificial gums are composed, or of so much of the whole substance or mass as may be desirable, in order to provide against any variation of colour being observable, in the event of chipping or grinding taking place.

"The mineral matters employed by different manufacturers of mineral teeth vary. I however lay no claim to any of such matters separately, but having obtained such matters either in the powdered or in a plastic state, I mix therewith any

suitable colouring matter that will incorporate itself therewith, and give the desired colour thereto as near as possible to imitate the natural gum. The colouring matter which I have found to answer well consists of gold leaf or gold filings combined with felspar, in the proportion of eighty grains of gold leaf or gold filings to one oz. of calcined felspar, ground or otherwise, intimately mixed together. Of the colouring matters thus obtained, I usually employ about four pennyweights to one pound of mineral composition (such as is usually employed by manufacturers of artificial mineral teeth); but I do not confine myself to these proportions, as they may be varied according to the degree of colour required. The colouring matter in all cases should be ground or otherwise intimately mixed with the mineral composition. I usually proceed, first, to mould material of a tooth colour to the form of the proposed teeth (one or more), I then add thereto mineral material coloured, as explained, giving to it the desired form of the intended gum or portion of gums, and I then fire or burn the same, as at present practised, when manufacturing teeth and gums from mineral matters. Mineral matters thus coloured to the desired gum colour may be moulded into the desired gums and finished independently of the teeth, or the teeth may be moulded and applied to the gums whilst such materials are in the plastic or powdered state and before firing, or the parts may be united by the fusion of vitreous matter or glaze between the teeth and gums. When the artificial gums and teeth are produced separately, according to the second part of my invention, I form the artificial gum with recesses or undulations, suitable to receive the base of the teeth, and I hold the teeth in position on the gums by wire passed through holes formed for the purpose through the artificial teeth and gums, and also through the metal mouth plate, when one is used, and then riveted; but the mode of fixing the parts together, as also to the metal mouth plate, when a mouth plate is employed, may be varied, as I do not confine myself to the means of fixing together such teeth and gums. And gums prepared according to my invention may have applied to them artificial teeth made of other material than that referred to.

"When the artificial gums are made, as here explained, separately from the teeth, the teeth may be more readily adjusted in length or otherwise, as may be desired, than when formed with the gum.

"Having thus described the nature of my said invention, I would have it understood that I do not confine myself to the precise details herein mentioned; but what I do claim is,—

"First, the combining or incorporating with mineral substance to form artificial gums of colouring or staining matters, as herein explained.

"And, secondly, I claim the forming of artificial gums of mineral substance separately from the teeth, and the fixing thereto of suitable teeth, as herein explained."

Lapsed January 24th, 1861, at the end of seven years.

1854. Henry Gilbert.—For improvements in connecting and supporting artificial teeth.

PROVISIONAL SPECIFICATION.

"I cover springs of steel or other suitable material

which are to be employed for connecting and supporting the upper and lower sets of teeth with prepared gutta percha or prepared india-rubber separately or combined. I also, in some cases, apply a thin-coating of gold by the electrotype process to the exterior of the india-rubber or gutta-percha covering. I also construct springs for the above-mentioned purpose of steel covered by a thin

coating of gold applied by the electrotype process. I also construct springs for the above-mentioned purpose, of solid or tubular form, of prepared india-rubber or gutta percha separately or combined."

This invention received provisional protection only. Lapsed September 1st, 1854.
(To be continued.)

Hospital Reports and Case-Book.

DEATH WHILE UNDER THE INFLUENCE OF CHLOROFORM; AUTOPSY.

(From the 'Med. Times and Gaz.,' Sept. 28th, 1861.)

(CUMBERLAND INFIRMARY. Under the care of Mr. PAGE.)

(Reported by Mr. DEVEREUX, House-Surgeon.)

T. C—, æt. 35, carpenter, was admitted on August 17th, 1861. A year ago he received an injury to his urethra, two inches from the perile orifice. He then had complete retention of urine, on account of which he became an inmate of an Infirmary, where he was relieved by tapping the bladder; and afterwards no catheter was got through the stricture.

During the last few months his urine has passed by drops. In this state he was admitted into the Cumberland Infirmary, and after several ineffectual attempts to pass a small catheter, and owing to the sensitiveness of the parts, it was proposed to do it under chloroform, to which the patient readily agreed.

On the 5th inst., chloroform was administered by Mr. Devereux, the house-surgeon, by means of a small piece of lint made in the shape of a cone. Two drachms were used. Insensibility was produced in the usual way, without the patient exhibiting any unusual symptoms. The lint was then removed from the mouth, and Mr. Page commenced the operation. In about two minutes afterwards a sudden change was observed in the expression of the patient's face. The lips became livid, the eyelids were half open, and the pupils were much dilated. He was then observed

to take a deep inspiration, and the pulse ceased almost immediately. Galvanism and artificial respiration were resorted to, and kept up for twenty minutes, without producing more than three or four spasmodic efforts at inspiration.

At the post-mortem examination, next day, the heart, lungs, and liver were structurally healthy, but slightly congested. The blood was fluid throughout the body. The kidneys.—The whole structure of the left was converted into ten cavities, varying in size from a hazel-nut to a pigeon's-egg, separated from each other by thin walls. Their interior was filled with a mixture of pus and a thinner clear fluid. The left ureter was much thickened, and filled with thick purulent matter. Right kidney weighed six ounces and a half, and appeared quite healthy, with the exception of its increased size. The walls of the bladder were thickened, and the urethra corresponding to the seat of obstruction was found nearly obliterated by a hard cicatrix.

DEATH WHILE UNDER THE INFLUENCE OF CHLOROFORM; AUTOPSY.

(From the 'Medical Times and Gazette,' Sept. 28th, 1861.)

(NEWCASTLE-ON-TYNE INFIRMARY. Under the care of Mr. ANNANDALE.)

(Reported by Mr. BOLTON, House-Surgeon.)

John C—, æt. 32, was admitted into the Newcastle Infirmary on August 15th, under the care of Mr. Annandale, for scro-

fulous disease of the left knee-joint. Amputation was proposed, and to this he consented, though the idea seemed to fill him with alarm.

On Tuesday, September 8rd, being operation day, he was prepared with others for operation, but being in a state of great trepidation he was ordered brandy prior to being removed to the operating-theatre. On being placed on the operating table he was still labouring under considerable alarm. Mr. Bolton, the house surgeon, in the presence of Sir John Fife, Mr. Annandale, and other gentlemen, administered chloroform. He was readily placed under its influence, without any respiratory or muscular excitement whatever. There was no more than two drachms of chloroform used, dropped in the usual way upon a simple fold of bandage held over the nose, and the tourniquet was being applied to the limb, when a sudden relaxation of the sphincters took place, the pupils dilated, the pulse ceased, and respiration continued but a few seconds after. Galvanism, artificial respiration, and other means were promptly resorted to without avail. He was dead.

At the post-mortem examination the right side of the heart was found gorged with blood, as might have been expected in death from cardiac syncope. There was no pulmonary congestion, and, further than might be expected in a scrofulous subject, there was no evidence of disease in any of the internal organs.

CONSERVATIVE SURGERY.

MR. JOHN JONES, Surgeon, of Ilfracombe, writing to the 'Lancet,' September 7th, states that a gentleman's valet, suffering from very severe facial pain, requested me to remove one of his under molars, and though I assured him the tooth was free from disease, it was extracted early in the morning. He put it in his waistcoat pocket, kept it there all day, and in the evening came again, requesting me to replace the tooth. With some little trouble I did so, and in about ten days it was as perfectly united by gomphosis as though it had never been removed.

In the 'Lancet,' September 28th, Mr. J. J. Cregeen, M.D., relates the following cases.

M. C—, in having a lower molar tooth extracted, so suddenly withdrew her head and caught hold of the key as to draw out a sound tooth with the decayed one. The former was immediately replaced, and perfectly united in a few days, never occasioning any trouble afterwards.

J. E— would have an apparently sound tooth drawn for severe toothache, which I accordingly did, and replaced it as in the foregoing case, and with a like result.

In another case, I drew a large molar (which had only a slight mark of decay), so as to break all attachments, but not to move it entirely from the socket, and then pushed it gently down again into its original position. The toothache was removed and the tooth saved, and never occasioned any trouble afterwards.

British Journal of Dental Science.

LONDON, OCTOBER, 1861.

WE have frequently endeavoured to impress upon the minds of the profession at large, that it is desirable that all should aid in lightening the great amount of work and anxiety which fall upon the shoulders of the few who undertake to

carry out some particular branch of investigation. We have noticed, with regret, that the majority of the profession show a lamentable want of interest in the practical working out of any plan which may have been started for the purpose of rais-

ing its status or extending its knowledge on any given subject. This indifference, we are well aware, is common to other professions or pursuits, in any movement. There are always the few who work hard, and the mass who look with carelessness upon their efforts, and yet who are ever ready to profit by the result of such exertions, if it should prove advantageous to their interest to do so.

Although our experience leads us to fear that the bulk of our profession will follow the same course in this respect as other bodies do, notwithstanding all that we may say, still we would wish to stimulate those who may be forgetful, or indolent, or diffident, to recollect that each member of the profession has his duty to perform, in trying to do his best to increase all information, and should be ready to undertake experiments, to let the results be known, and to feel that each has his work to do.

We sincerely trust that the invitation given at the last meeting of the Odontological Society, respecting specimens of different fillings, the materials used, and their manner of application, which, it was requested, should be forwarded to the gentleman who brought the subject under the notice of the meeting, for the object then named, will meet with a very general and cordial response.

The subject is a most, if not the most, interesting one that can be investigated and discussed by dental surgeons, and the gentleman who has undertaken the task to examine the specimens and report the result, is so eminently qualified and adapted for the work, that we cannot doubt that a very great amount of most interesting information will be gained by his labours. We would, therefore, remind our readers, that in such a matter as this they should show no indifference or indolence.

It would be pity, indeed, if a genial response were not made to this request; and as there may be some members of the profession who may possess the idea that they are unknown, and therefore that their contributions might be ill-received, from

these we would wish to remove all such misconceptions. To such we beg emphatically to say, that there is no earnest worker in the profession who, if he communicates courteously with any of those who have the direction of the different means which have been instituted with the desire to improve it, whose communications will not meet with a very cordial and courteous reception.

At last the College of Dentists, more correctly designated the Company of Dentists, is obliged to throw off the mask and stand before the profession in its true colours, as an institution so largely dependent upon advertising dentists for its maintenance, that the recognition of dental advertisements has become a college necessity. We are informed, through the organ of the college, the 'Dental Review,' that advertisements are to be divided into two classes, reputable and disreputable, distinguished by the definitions, "Whatever is true and honest is reputable; whatever is false, and pretentious, and dishonest, is disreputable." This, we are told, is a truism. We wonder how our friends of the quasi college, or company, would like to have the rule they have laid down strictly applied to themselves. How would they like to see each pretentious man marked out as a disreputable man. However, it is all easy sailing with mere pen and ink navigators: Now comes the illustrations of the principles advanced: "If a man simply states his professional address, with his hours of consultation, and that statement be true, he does no more moral harm than when he puts his plate on the door of his residence, and leaves a message that at certain hours he can be seen"—in other words, it is not objectionable or pretentious to thrust your name and calling under every man's nose who takes up a newspaper, but it is "morally and justly a proper advertisement in our sense of the transaction." "But when a man pretends to do what others cannot do, or offers to undersell

his brother practitioner, he does moral harm, and puts forth an advertisement which no profession could sanction." We would ask the rulers of the College of Dentists—learned in definitions, and able as law makers—why they object to price lists in advertisements, or to the offers to undersell, which a price list usually involves. The habit clearly comes within their definition of "reputable," for a man may, with perfect truth and honesty, accept a lower fee than his neighbour, and, if it be allowable that he should use the newspapers to spread his fame, the statement of fees, if a true statement, cannot be objected to as "disreputable." What moral law is violated—what moral harm is done—by "offers to undersell"? Is not underselling one of the principles upon which trade is based? A fair field and no favour is all that a tradesman requires; and so long as he keeps his engagements and regards the truth, his character is preserved, although he may be selling his goods at a lower price than his fellow tradesmen.

The College of Dentists, in accepting and vindicating a usage abjured by professions and adopted by trades, accords to its members the position of tradesmen, a proceeding to which we can offer no objection. But in the name of our professional brethren, we protest against the issue of a trade-mark bearing the form and external characters of a professional qualification, and liable to be mistaken for or used as an authentic diploma. The document, if carefully examined, will, we fear, fall under the second class of advertisements, if our contemporary's definitions be accepted. The college, through its organ, having laid down rules for our guidance, we will see how far they are themselves disposed to honour their own precepts. We again quote from the 'Dental Review':—"It was on an acknowledgment of principles such as these, that the College of Dentists at its commencement passed its laws respecting advertisements and advertising members. From

then until now the college has acted in strict accordance with those laws, except in *three* or *four* exceptional cases, which, through the inadvertence of a former scrutiny committee, were allowed improperly to pass uncriticised."

Out of the thirty advertisers in the college list, we are quite at a loss to select the three or four. We will give a few extracts from the advertisements; our readers may then be able to distinguish the *three* or *four*, and how far it will be desirable to apply the truth and honesty test to institutions as well as to individuals.

No. 1, 1860.

Mr. —, Surgeon Dentist, has purchased a license for the practice of the Science of Cheeplasty; also for that of the Vulcanite Base, &c.

No. 2, 1861.

M.C.D.E.—Mr. —'s method of fixing Artificial Teeth combines every improvement pertaining to his profession.

No. 3, 1861.

M.C.D.E.—A new and important Discovery—Perfection in Artificial Teeth. From one to a complete Set, at reduced charges.

No. 4, 1861.

Artificial Teeth of the best quality and construction, &c.

No. 5, 1861.

In tender mouths they are able to fit Plates to the Stumps, without the amount of irritation usually produced, &c.

No. 6, 1861.

Mr. —, Member of the College of Dentists of England.

No. 7, 1860.

By Special Appointment to Her Majesty and Royal Family.

Vulcanized India Rubber as a Base for their patent Artificial Teeth, &c.

No. 8, 1861.

Specimens may be seen by applying as above, &c. Persons may be attended at their own residence without fee.

No. 9, 1861.

Sole Inventor and Patentee of an Improvement in the Construction of Artificial Teeth.

No. 10, 1861.

Artificial Teeth, guaranteed to answer every purpose. Not to be surpassed.

We are not yet half through our list of

thirty; is it necessary to go further in the citation of instances to prove that the definitions and rules with respect to advertising advanced by the organ of the College of Dentists have not been observed by the college itself? The advertisements in which the name, address, profession, and hours of attendance are simply stated, are of comparatively rare occurrence. In the college list of advertisers not more than five or six will be found who use the form of advertisement eulogised by our contemporary as a morally and justly proper advertisement. These are, in fact, the three or four exceptional cases, but they, unfortunately, for the candour of our contemporary, fall under the first, while the remaining score and upwards fall in accordance with his own definition into the second class. "Three or four" of these are repudiated, and the remainder are accepted. Hence the definitions and rules, when applied to their own proceedings, break down and are shown by the framers themselves to be worthless.

In the cause of truth and honesty—words frequently used by our contemporary—we would recommend the College of Dentists to boldly advocate advertising; and as a thing, if worth doing at all, is worth doing well, we would further suggest that prizes should be awarded to those members of the guild who produce the most telling dental advertisements. Already some of their members have arrived at considerable distinction in this department of literature, but we do not despair

of still greater eminence if proper encouragement be given. The College of Dentists boasts of its liberal views, and its reputation cannot suffer by announcing free trade in advertisements. The proposed sliding scale is an obvious failure, and although useful as a popular cry, has already been abandoned in practice by its proposers.

No one will have the temerity to deny that truth, honesty, and morality, should rule our actions, whether public or private. But there are other rules which the general voice of society commands us to observe. In professional life the use of advertisements is condemned, and we must observe the rule, or be thrown out of the pale of professional society. There is no middle course. Advertisements and the quasi college or veritable Company of Dentists; or a professional position maintained by the observance of professional usages. We must, each of us, choose our own position. There are some whose antecedents clearly show that the hope of pecuniary gain overrules all other considerations; but there are others, and they form the vast majority of the members of our branch of the medical profession, whose feelings of self respect and whose high sense of propriety will lead them to spurn any course which would tend to lower the position or injure the interests of their professional brethren. The former we regard with regret; the latter command our respect and confidence.

Literary Notices and Selections.

WE have, with the permission of Dr. Murchison, made the following extract from the able lecture he delivered to the students of the Middlesex Hospital Medical College on the opening of the present session. The sound advice addressed by

Dr. Murchison to medical students generally, applies with equal if not greater force to those who are destined to follow either of the special branches of practice into which medicine is now divided, and the perusal of the extract by the members

of our own calling may not be unattended with advantages.

"But secondly, you must devote your lives to the prosecution of medicine for its own sake, and not for that of the honours and emoluments which it confers. The honours which the medical profession holds out to its votaries are, indeed, few. When it is remembered that medical men are virtually excluded from the highest honours of the state, and that it is vain for even the most distinguished to aspire to a medical peerage, it is plain that the preacher's injunction—'The physician shall receive honour of the king,' is in this country all but disregarded. Almost the only prizes which the profession at present offers to its members are extensive practices, with large professional incomes. But it may be doubted if these so called prizes are not in many ways the bane of our profession. Unfortunately there exists no necessary relation between the popularity of the practitioner and real professional worth, while nothing can be more deplorable than to see a medical man prostituting his time, honour, and talents, the interests of his professional brethren, and the welfare of his patients, to his own inordinate love of money and desire of being thought great and consequential. 'By large practices,' says an anonymous writer, 'the high scientific tone of the profession is depressed, its independence sunk, a low standard of effort fostered, the individual who succeeds is rendered worthless, the public cheated, false practice authorised, quackery promoted, and sterling merit often deprived of its just reward.'

"I do not mean to deny that members of our profession exist who are bright exceptions to the remarks which I have made, but I would impress upon you, that the temptations of a large practice are so great, that you must not regard a prize of this sort as the main object of your lives. It is true that you have to depend upon your profession for gaining your daily bread, and for making a provision for yourselves and families, and that well directed efforts towards the attainment of these ends are both justifiable and commendable. But you must beware of regarding your profession in a commercial or mercenary light. Your business, like that of the clergyman, is with human beings and not with commodities that can be bought and sold. 'Knowledge is not

a shop for profit or sale, but a rich storehouse for the glory of the Creator and for the relief of man's state;' and certainly to no department of knowledge are these remarks of England's first Lord Chancellor more appropriate than to medicine. Your ambition of success ought ever to be subservient to the desire of doing your duty, and of relieving human suffering. It is to be feared that the mercantile views of our profession, against which I am warning you, are widely prevalent, and more than ought else, account for the low status that it occupies in public estimation. I rejoice, therefore, to be able to couple with my warning, a word of congratulation.

"The days of the Apothecaries' Company, as a body for licensing practitioners of medicine, are numbered. The recent decision of the Vice Chancellor leaves little doubt, that ere long the new license of the College of Physicians will take the place of the license of the hall. Admitting that great merit is due to the Apothecaries' Company for having done much to raise the standard of medical education, amidst the apathy and neglect of other corporations, which are now profiting by its labours and example, it cannot be doubted that the double license to sell medicine and to treat disease, granted by the Apothecaries' Company, has been the chain which has connected the profession of medicine with a trade, and that from it has sprung that abuse of drugging which has been the secret of the success of homœopathy, and other systems of quackery. That chain has now been broken asunder. In Scotland, where there is no Apothecaries' Company, the profession exhibits much less of that mercantile aspect which too often characterises it in England. It is to be hoped that the day is not far distant when we in England shall no longer see a member of a learned profession, converting his calling into a trade, and catering for the patronage of the public, by puffs and other artifices of which even an honourable tradesman would be ashamed.

"The impending downfall of the apothecaries' license, and the determination of the medical council in respect to preliminary education, will unquestionably effect a mighty revolution in the medical profession, and by elevating the thoughts and aspirations of each individual member, will exalt the status of the entire body.

"The third piece of advice which I would give you is, that you never sacri-

fice your truth and honour to personal advantage, or to professional distinction and advancement. Although professional distinction is a laudable object of ambition, you must be more careful to deserve distinction than to seek it; and above all, you must beware of seeking it at the expense of your neighbour, or by means which the still small voice of conscience will tell you to be not strictly honourable.

"No legislation, nor any system of medical registration, can put down quackery, or even exclude irregular practices: from our members these objects can only be attained by individual medical reform. Every one of you must be scrupulously circumspect to do nothing which can be construed into a support of such practices on your part. You must not only abjure quackery in every form yourselves, but you must avoid lending any countenance to it in others. You must show the public by your conduct, how great is the difference between you and the pretentious charlatan; and you must beware meeting such a person on terms of professional equality. Neither the plea of humanity, nor any other subterfuge, will justify a step by which a member of our profession descends to the level of a quack."

PROFESSIONAL ETHICS.

By C. P. FITCH.

(From 'The Dental Cosmos,' September, 1861.)

THIS subject, as applied to dentistry, is one of very extended signification, embracing rules which should unquestionably govern the entire sphere of professional employments. It is used as a caption to this article, suggestive of a few thoughts which I wish to note touching (to some) a very unimportant department of dental duty.

Professional consultation or advice is as frequent as professional interviews; and very often an operator is called upon—if not solicited, the prerogative is oftentimes assumed—to pass judgment upon the work of a professional brother. Many times this is an imperative duty, not at all optional with the examining party. He stands to his patient as a conservator, in a certain sense, of the harder tissues of the oral cavity; and he cannot therefore with impunity withhold his judgment.

But when and how should this duty be performed, dispensing justice to the patients and former dentists? Evidently it should not be postponed to a future sitting, either from a fear of giving offence to predecessors, or from apprehended danger of incurring the charge of cupidity or sordidness either from the patients or parties directly interested. Whether an acquaintance or a stranger, if the advice be sought, a fair *exposé* of the present condition of the teeth is due.

This duty should be performed without exhibiting any malign *animus*, compromising the operator in remarks, calling in question the quality of the operation at the time of its performance. This is not called for; neither is the act justifiable; and no honorable gentleman will be guilty of such a dereliction of good breeding. A full, plain statement of facts, touching the matter under consideration, should be made, and this at the time the advice is asked. Viewing this subject from a high and honorable stand-point of professional obligation nothing less could be done, and more than this should not be expected.

The practice of an indiscriminate condemnation of all operations found in the mouths of persons whose great misfortune seems to have been in falling into other dentists' hands, is, to speak in the mildest terms, highly censurable; and the person habitually guilty of this charge should be shunned as the plague or pestilence. We sometimes hear such expressions as the following: "I dread to change dentists, for I expect to have every filling removed that has ever been done in my mouth," or something similar is not by any means uncommon. Evidently the practice alluded to is indulged in to some extent, or such sentiments would never find their way into aphorisms of any community. No doubt many an operator is betrayed into an expression of censure by the adroit remarks and questionings of his patient. But this is quite unfortunate. Whenever this is attempted, it should be met promptly with its appropriate but mild rebuke, defending the claims of dental science, and vindicating, as far as it can consistently be done, the professional character of her former representative. Certainly, if we are not held responsible, prudence would dictate silence. But, what! should never a word be said in the presence of a patient, derogatory to an operator? Most assuredly not. We have to do with the present state of the teeth and their artificial appliances, and

not the dentist. We are at liberty of course to think what we please; but reserve should mark our censure touching him, for our conclusions may be entirely groundless, from the following considerations.

We can never know the disadvantages attending such services. Again, there are many subsequent circumstances over which the dentist could have no control whatever; such, for instance, as cleanliness; local and constitutional diseases, assailing at once the biotic or life-force; a general or specific derangement of the nutritive or eliminative processes, seriously affecting organic or functional action; and frequently the consequent rapid changes wrought upon the texture of the tooth itself. These, if no other considerations, should ever impose a rigid check against an indulgence the propriety of which, under any circumstances, is very seriously questioned. We are happy to notice and record the fact, that the most intelligent, honorable and high-minded gentlemen of our profession are willing to acknowledge merit wherever and whenever met with. Indeed, to accord the meed of praise, when the evidence of faithfulness and superior operative quality is immediately under one's inspection, will go much further to establish, in the minds of those seeking our counsel, confidence in us, and command from them a recognition of a high order of dental ability and acquirement, than the opposite course; and such acts must ever yield a rich harvest of satisfaction and conscientious delight for having done to our professional brother that which we, under similar circumstances, would like to receive at his hands; especially if deserving, and if not, to let a discretionary silence mark the interview. It is to be

most devoutly hoped that the practice of general censure, and the exhuming of supposed decay under stoppings, are fast passing away, and will soon be recognised only as matters of history; and the thought would be quite refreshing that when patients were under the necessity of seeking the professional skill of a stranger, that they could be relieved from the fear of having former operations condemned and destroyed, under the plea of utter worthlessness or great imperfection. At the present time, perhaps the tendency, with the best of operators, is to promise too much in view of the great advances in dental science and practice. These promises are many times based upon honest convictions.

A happy mean lies just here, without foisting upon our patients the thought that we have yet to meet with the first instance of failure in *our* practice, in the treatment of any and every class of teeth under a variety of constitutional temperaments, &c.; we may safely, at the same time, afford them all the hope and comfort which arises from the thorough methods of practice now adopted in operative and mechanical dentistry.

To recapitulate—our position is this: that a manly and full statement of facts should always be made to those seeking professional advice, abating all reflections calling in question the integrity and ability of a predecessor, and that we should never claim too much for our own performances, especially when it may directly or indirectly compromise the character and standing of a professional compeer.

Philadelphia;
August, 1861.

The Month: Miscellaneous and Scientific Intelligence.

A TRAVELLING DENTIST AND AN UNPROTECTED FEMALE.

A REMARKABLE CASE.

(From the 'West Sussex Gazette and County Advertiser,' September 12th, 1861.)

At the recent Isle of Wight County

Court a remarkable trial took place between one *Samuel Allen* and *Hannah Ash*. The plaintiff, who is a travelling little Jew dentist, rejoicing in the appellatives of "Simson and Allen, surgeon dentists," brought an action to recover from the defendant, a servant girl, the sum of £3 15s., for supplying her with a new set of false

teeth, and the evidence disclosed one of the most extraordinary circumstances ever detailed in a court of justice, the poor girl having failed to arrive at the life of "continual enjoyment" held out in the plaintiff's circulars to all who would submit to an operation under his hands, and the educational qualifications of this "Surgeon Dentist" may be judged of by perusing the *verbatim* copy of the demand made on the defendant:

"No 2 albart place, high Street, Ryde,

"July 22th, 1861.

"to hanner Ash Maken 6 teeth in vulcanised Inderuber and minral teeth at 12s6d per tooth £3 15s gold springs &c.

"Unless this bill Be Paid by 12 o'clock on Tusday 23 i shall somens you at the County Court New Port and Clame my travelen expenses &c fram London and far lass of time &c.

"S. ALLEN.

"to hanner Ash, east Mount at Mr Cramer."

From the evidence of the plaintiff, it appeared that he lived at 17, Caledonian-row, London; but he did not publish his address, and the name "Simpson" was a myth, as that gentleman had been in Australia for sixteen years. His bill was for extracting seven teeth and putting in new ones. But the girl's master hearing of the fraud took her to a proper dentist to get her mouth put to rights, and resisted the claim made.

The poor girl said: I am cook to Mr. Cramer, at Ryde. The defendant walked in when I was in the scullery, and asked me for a paper he left, and then he said to me, "Let me see if your teeth want any rectifying," and he said some of them wanted repairing. I opened my mouth because I had the toothache so bad, and he broke off the teeth directly I did so. I did not request him to do so, or to extract any of them. My mouth bled a great deal, and I got some water to wash it, and then he said he would take my model, and put four more new teeth in a gold plate for two guineas, after he had broken them all off, and I was so frightened at losing them that I asked him to make me some more. He never extracted any stumps, and was only three-quarters of an hour, and he caused me such violent pain that I was almost crazy all night. He said he had been established fifteen years in Ryde. When he brought me those teeth I said they were not made to order, and I wouldn't have them. I never authorised him to break off my teeth, and I didn't know that he was using an instrument, till he had

broken them off. Then he asked if there was any beeswax in the house, and the blood was running out of my mouth at the time.

Plaintiff: Vy they asked me in to stay a little while, and she sat down in the chair, and no pody helt her. There was no pain at all, that is, no *particular* pain. They vas all rotten.

The Judge (addressing the Jew) said there is very strong evidence that you cut off the defendant's teeth without her consent, under the plea of looking at her mouth, and the process, as described, was never contemplated by the defendant. If, therefore, you hold out misrepresentations to ignorant women in this way, you must be prepared to stand the consequences. If it had occurred in an ordinary dentist's shop, the defence which has been set up would have been incredible, but here, in a kitchen, amongst a number of unprotected females, the unusual method in which you proceeded to procure orders, cannot be countenanced, and I give judgment for the defendant, with costs.

THE TEETH OF THE GORILLA.

THE rich series of skeletons and skulls of the gorilla have illustrated the most important phases of dentition. The deciduous or milk dentition exhibited by the youngest specimen consists, as in the human child, of

$$\begin{array}{ccccccc} 2-2 & & - & & 2-2 & & \\ I & \text{---} & C & \text{---} & M & \text{---} & \\ 2-2 & & - & & 2-2 & & \end{array} = 20$$

But an interspace equal to half the breadth of the outer incisor divides that tooth from the canine, and the crown of the canine descends nearly two lines below that of the the contiguous milk molar. Professor Owen detailed at length this portion of his subject, pointing out the difference from the dentition of the human child, exhibited by the several specimens. In the later development of the canines, and in the earlier development of the second molars, of the second dentition, the gorilla differs, like the chimpanzees and orangs, from the human order of dental development and succession. An opportunity of observing this order in the lower races of mankind is rare. Professor Owen had availed himself of it in the case of the male and female exhibited, in London, as specimens of the "dwarf earthmen" from South Africa.

He found in their teeth the dentition at the phase indicative of the age of seven years to nine years in the English child.—*Times, September 6th.*

To Correspondents.

NOTICE.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.
2. All communications relative to subscriptions and advertisements are to be addressed to the Publisher, Mr. John Churchill, 11, New Burlington Street, London, W.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. The Journal will be supplied direct from the Office on PREPAYMENT of subscriptions as under:

Twelve Months (post-free) . . . 13s. 0d.
Six Months " 6s. 6d.

Post-office Orders to be made payable, at the Regent Street Office, to John Churchill, 11, New Burlington Street, W. A single number sent on receipt of thirteen stamps.

"C. A. Rodway."—We have not tried the paste, but will see to it.

"W. Dunn, Florence."—You have our best thanks. We shall always be glad to hear from you, although we may not always immediately avail ourselves of your kindness.

"E. Ward."—Send us a list of the resident practitioners. We are unable as yet to reply to your question.

Communications have been received from Messrs. J. L. Levison; G. Owen; J. H. Kyan; C. Price; C. A. Rodway; W. Dunn, Florence; and O. A. Fox.

BOOKS RECEIVED.

'A Catalogue of Artificial Teeth and Dental Materials Manufactured and Sold by Claudius Ash and Sons, 7, 8, and 9, Broad Street, Golden Square, London.'

'Dental Register of the West.'

'Dental Cosmos.'

[ADVERTISEMENTS.]

JOHN HEARN, GOLD AND SILVER REFINER AND SMELTER, 3, Wardour Street, Oxford Street, Soho, W., and 1, St. James's Street, Clerkenwell Green, E.C. Dentists' Gold, Silver, Board Sweep, &c., melted, and the utmost value given. Photographers' Paper Cuttings, Chloride of Silver, Filtering Papers, Solutions, &c., collected and bought. Jewellers', Dentists', Gold Beaters', Silversmiths', and Gilders' Floor Sweep and Polishings bought by sample. Full value given for Old Gold and Silver, Gold and Silver Lace, Bookbinders' Gilding, Cloths, Skewings, and Dischargings. Gold, Silver, and Parting Bars bought by Assay. Gilding and Plating done by practical workmen. *Melting done for the Trade.* The utmost value given for Old Silver Plate. Consignments and Remittances punctually attended to.

ROSTAING'S Unalterable and Non-poisonous MARBLE CEMENT for filling Carious Teeth and Restoring Decayed Teeth to their original forms and use, with a Pamphlet indicating and illustrating the methods of using it. In cases at 21s. and at £6 each.

Also ROSTAING'S PLASTIC COMPOUND for taking Impressions, at 15s. per lb.

Apply only to Messrs. JOHN GEDGE and SON, the Patent Office, 11, Wellington Street, Strand, London.

CONDY'S Patent Ozonized Water, for the

Bath and Toilet, removes impure and foreign tastes and odours from the mouth, strengthens the gums, is antiseptic, and is in a high degree adapted for purifying the mouth, for preserving the teeth, and for the immersion of artificial teeth. It purifies and softens the skin, allays irritation, removes secretions, stimulates and promotes the healthy action of the skin, and tends generally to the creation and preservation of a healthy state of the body. In stoppered bottles, 2s.; double size, 3s. 6d.

Wholesale Agents, J. BELL & Co., 338, Oxford Street, W.; P. SQUIRE, 277, Oxford Street, W.; and T. LEMALE and Co., 62, Chandos Street, W.C.

W. T. TAYLOR,

MANUFACTURER OF THE IMPROVED (AND ACKNOWLEDGED STRONGEST)

MINERAL TEETH,

Begs to inform the Profession that Faulkner's beautiful No. 3 neutral-tinted Rubber (the only one of the kind in the market), 21s. per lb., and the No. 1 Orange Rubber, 16s. per lb., can be obtained, warranted genuine, at his Depôts, at the above prices, any additional charges made by others being an imposition and superfluous.

Every requisite for the surgery or work-room of the best makes.

DENTAL DEPOTS,

25, BROAD STREET, GOLDEN SQUARE, LONDON, W.;

AND

25, NEW STREET, EDINBURGH.

Catalogue of Prices, with a general reduction, free per post on application.

BANKERS—UNION BANK, Argyll Street, Regent Street.

British Journal of Dental Science.

No. 65.

LONDON, NOVEMBER, 1861.

VOL. IV.

Dental Surgery and Medicine.

ON METASTASIS.

By Dr. J. L. LEVISON.

It is well known that there is often observed when there exists a chronic form of disease in any one organ, that its morbidity seems suspended whenever some acute form of disease is set up in either a neighbouring or remote organ, and this is called "metastasis," but the word does not elucidate the cause, but simply expresses the fact that there is often known to be a change in the seat of a disease.

For example, we have seen amongst many instances which could be cited, that of a gentleman who suffered for years from a bronchial affection, which induced an almost incessant cough. He had, however, occasional attacks of gout in his feet, and that whenever he experienced the latter form of disease his cough ceased to annoy him. But as soon as the gout left him the teasing and exhausting cough reappeared with greater severity.

We could cite many similar instances, but they would not enable us to explain the *modus operandi*, they would merely become so many more cases to furnish evidence that such alternations and translations of disease are not uncommon occurrences.

Still it is important to record such facts if merely with the hope that at some future time *the law which influences these changes may be ultimately elucidated*.

In connexion, therefore, with the object of the 'Dental Journal' the following case may be cited, from its special interest. Although it may not unfold the cause of metastasis, yet it will have a significance from its clearly indicating that this class of phenomena is dependent on some species of vicarious action hitherto unexplained.

Mrs. J—, a woman of a strumous habit and a pauper, residing at N—, in Nottinghamshire, had had a large kind of tumour in her mouth, which had been supposed by some practitioners to have been a *fungus hematodes*, and by others that it was an aneurism of one of the large branches of the palatine artery. Prior to our seeing it, it had gradually increased in size, so as to nearly fill the mouth, extending downwards to the uvula, and besides its constant inconvenience there was a danger of her being suffocated.

On carefully examining it, under very great disadvantages (from the teeth being closed and the temporal and masseter muscles being rigid), we ascertained that it was attached by a pedicle to the upper jaw, at the place occupied by the second molar, and that it seemed not improbable that it was in some way connected with the antrum.

Having decided to operate, we used an instrument in the form of a bistoury, the end of which was rounded so as not to hazard wounding the cheek, and it was of sufficient thickness to be gradually brought close to the tumour, by forcing it between the teeth. But in order to prove the correctness of our diagnosis, namely, that the nucleus consisted of either dead jaw-bone or loose carious teeth, and to avoid any positive danger, we removed a portion of the lower end of the tumour, and then with a bent silver probe satisfactorily proved to the medical gentlemen present that there were moveable, hard bodies within it. And afterwards we separated the whole mass, by cutting through the pedicle at its attachment. The hæmorrhage was great, and after this depletion the mouth was easily opened, so as to admit the mass being removed. When

the tumour was cut open it was found to contain a number of pieces of carious bone, perfectly black. These had formed the nucleus for this morbid growth.

It may be incidentally mentioned that she had never communicated any information to those who had seen it prior to ourselves, how the disease commenced, or what she supposed had induced its formation. Nor had she stated the fact that prior to its existence she had suffered from severe attacks of epileptic fits from her childhood, but which never troubled her all the time the tumour was forming.

But when the cause could be ascertained, without her aid, she made the following voluntary confession. "That one of her brothers had struck her on the face with a bludgeon eighteen years since, and that the suffering in her mouth, and the gradual increase of the tumour, had continued from that period. That she had not applied for any relief until she was deprived of eating any solid food (then two years past), and from the fear of being choked, which conjointly made her life a constant misery," or words to this purport, and she further said, "that from the time of the blow and its painful effect on her mouth she had never had a fit."

The cure was perfect. The part cicatrized, so as not to leave a slight mark where the morbid growth had been attached. And the benevolent surgeon who urged us to see Mrs. J— gave, like ourselves, his medical service *sans* a fee. From, however, the want of solid nourishing food, from which she had suffered so long, we deemed it important, each on his own responsibility, to address the board of guardians to give her extra relief, she having had only two shillings and sixpence a week! But these "guardians," in their great wisdom, refused to increase her allowance. We made a collection for her prior to leaving the town.

Whether the want of proper nourishment might have had any influence on her constitution we cannot say, but we ascer-

tained that her epileptic fits returned with great intensity, after being free from them the whole eighteen years in which the tumour was forming, and that then she had them with the usual periodicity which marks this disease; that they continued unmitigated, so that within two years after our operation she died from one of these very fits.

It is not our intention to offer any solution to these phenomena, but simply to call attention to an important fact in disease during the period of the first and second dentition, namely, that cerebral irritation, which might induce convulsions, &c., is prevented by nature by a species of metastasis, in which a crop of pustules is thrown out upon the skin, more or less extensive. And that, with the exception of their annoying children thus affected, such children have their functions, bodily and mental, perfectly normal.

How can we offer with our present knowledge any conjecture on these facts?

For example, that epilepsy had existed from childhood in the case of Mrs. J—, that a morbid growth in her mouth had kept down the cerebral disturbance, that the epileptic fits were suspended, but not cured, and that when the new disease which had been set up had been arrested by the excision of the tumour, and that then the fits returned stronger than ever.

Was the epilepsy an indication of some functional disturbance of the brain, and that the tumour had in some mysterious manner acted as a species of counter-irritation?

If such were the case, we may understand some little more the meaning of the term metastasis, for as soon as the counter-irritation ceased in the mouth, by the loss of the morbid growth, the morbid condition of the brain returned, and then the disease long in abeyance was renewed with greater intensity.

7, Henstridge Villas, Ordnance Road,
St. John's Wood; Nov. 6th, 1861.

Mechanical Dentistry.

DENTAL PATENTS.

By GEORGE OWEN.

(Continued from page 271.)

1854. Simeon Mosely.—For improvements in the manufacture of artificial palates for the adaptation of artificial teeth.

"My invention consists in so forming artificial palates or plates to which artificial teeth are to be affixed as that they adapt themselves readily to the roofs of the mouths of persons to whom they are to be fitted; and the principal feature in my said invention consists in forming such said palates with a series of small indentations of different depths; that is to say, those indentations which are at the middle of the palate are formed considerably deeper than the surrounding ones. The object and intention of thus forming the palates is to increase the surface of the air-cells produced by such indentations, and at the same time to distribute the pressure over the entire surface of the roof of the mouth instead of effecting the adhesion of the artificial palate by causing pressure upon any one part of the mouth in particular as heretofore generally practised in constructing artificial palates. And in order to explain my said invention as completely as possible, I will now proceed to describe the best means I am acquainted with for carrying the same into practical effect; that is to say, I first take an impression or cast of the form of the mouth to be fitted with the metal palate, which I make of corresponding shape to the said cast by striking up a piece of gold, silver, platinum, or other precious metal by any of the means in known and common use for shaping articles in sheet metal, or any combination of the said precious metals alloyed with other metals, in the manner usually practised; and I attach the artificial teeth to such said palate by forming holes in the plate, and riveting or soldering thereinto the pin to which the tooth is affixed, or by any other suitable and convenient means; and if necessary, I strengthen the edges of the palate by making such parts thicker than the other parts of the plate of which the palate is formed. And further, if desirable, a piece of thin india rubber or caoutchouc of the same size as the metal plate, and punctured with holes corresponding to the indentations in the metal palate, may be employed to assist in effecting perfect adhesion of the palate to the roof of the mouth as the air is exhausted from the air-cells or indentations in the before-mentioned metal plate or palate. And I would here remark that my invention is equally applicable to the manufacture of artificial palates formed or carved from the tooth of the hippopotamus or sea horse, and such other natural ivories as are commonly employed in and for the manufacture of artificial teeth and palates, observing that in using such material for the purposes of my said invention, the air-cells or inden-

tations are formed by carving the ivory at such said parts.

"I do not claim the exclusive use of any of the materials above mentioned and referred to, except in so far as the same may be employed in combination and for the purposes of my said invention; neither do I claim the making of metal palates with air-cells or chambers, as I am aware of the same having already been practised in the construction of artificial palates. But I do claim as of my invention, the constructing of artificial palates in the manner hereinbefore particularly described and set forth, as being more efficient than the means hitherto practised of constructing artificial palates."

Lapsed March 10th, 1857, at the end of three years.

1854. Mahlon Loomis.—For improvements in the manufacture of artificial teeth.

ENTIRE SPECIFICATION.

"My invention consists in making whole sets, or the upper or lower halves or parts of sets of artificial teeth, all of porcelain.

"A half set consists of but one piece of material, there being no metallic plate as in the usual way; but the same material of which the teeth themselves are made is used instead of a metallic plate.

"To make a full set of artificial teeth, thin silver plated or other proper metallic plates are first to be accurately fitted to the upper and lower jaws, in order that the exact size and shape of that part of the mouth to be fitted may be definitely known. These plates are to be made by the ordinary process of gold plates, to which sets of teeth are usually fastened. Wax is next to be placed upon these plates, in order to determine somewhat the length and position of the teeth to be made. Next, the inside of the plate, or that side which is applied to the flesh of the mouth, is to be fitted and covered over with dentists' plaster [wet to a convenient consistence], and said plate with the plaster is to be placed upon a thin bed of the same plaster, so that the plaster on the plate shall rest on the bed of plaster. To prevent the bed of plaster from spreading and the better to shape it, it may be confined by means of a strip of sheet iron about an inch in width, bent somewhat in the form of the letter U, and continued straight across, so that the ends may touch each other.

"When this bed of plaster has become sufficiently hardened, the sheet iron or metallic form last mentioned is to be removed. The metallic plate is next to be taken off from the whole of the plaster; the plaster after this may be neatly trimmed. When this plaster cast, upon which is to be formed the upper half of the set of teeth, is to be enlarged, to counteract in part the effect of the shrinkage of the porcelain material consequent upon baking, such may be effected as follows:—As different mixtures for porcelain differ in the amount they contract by

baking, the extent of enlargement [as near as I can estimate this enlargement, I should say, that, generally speaking, it would increase the dimensions of the mould one sixteenth of it] must be in proportion to the amount of shrinkage, which may be ascertained by measurement and experiment.

"This ascertained, the aforesaid plaster cast, upon which is to be formed the half set, or that portion of the upper jaw, may be scooped out sufficiently to allow for shrinkage, and it may be extended back or lengthened the proportional distance from the mark left by the rear edge or limit of the plate, and so as to allow for the longitudinal shrinkage. When the enlargement of the plaster cast has been completed, the wax which was before placed on the metallic plate is to be removed therefrom and placed on the plaster cast, the deficiency at its two extremities being supplied, if necessary, its height and breadth corrected [if requisite] by the addition of other portions of wax. This wax so put on the cast is designed to form a space between the two pieces of plaster which are to compose the matrix for forming the porcelain material of the teeth.

"After the wax has been thus adjusted it may be oiled, in order that prepared plaster, which is next to be poured or placed upon and over both the wax and remaining surface of the plaster cast upon which it is placed, may be subsequently the more easily separated from said wax and plaster, which separation is to be effected when this plaster last used has become hard or set. This plaster last put on is for the purpose of forming the other portion of the matrix. Next, a sufficient portion of the plaster so removed must be cut away from the whole mass, in order to make, when the two parts of the mould are placed in contact, a space which will admit of the porcelain mixture running back far enough to form that portion of the upper part of the set which is usually made of metallic plate. The space thus made between the masses of plaster constitutes the matrix for forming the upper portions of the set of teeth.

"That matrix for forming the lower portion of the set of teeth is to be made in a similar manner. The enlargement may be done by sawing the mass of plaster apart crosswise, and next glueing the parts firmly together with a piece of wood between them, such piece of wood to correspond in thickness with the amount of shrinkage of the porcelain material in a longitudinal direction. Next, the whole may again be cut apart at right angles with the first separation, and again glued together with a similar strip of wood between the two halves, such strip allowing for the transverse shrinkage.

"Now the inferior or last made half of each of these matrices may be spaced off upon the edge which determines the outer surface of the porcelain material, and so as to determine the width and position of the teeth to be made. First, that for the upper teeth is spaced off to suit the occasions then to space that for the lower teeth, the flat side; of the two may be placed together, and that for the lower teeth spaced by marking between the spaces of that for the upper teeth; then, after thinly coating with bayberry tallow that surface of the matrix which is a representation of the part of the mouth to be fitted, it is ready to receive the porcelain material, which may next be carved or shaped as may be necessary. This being done, the mass of porcelain may be warmed until it melts the tallow beneath, so as to admit of its being removed from the matrix.

"While in this condition, any desirable shape may be given to its edges of the part so formed in the matrix by applying, where desired, a thinly diluted portion of the porcelain mixtures by means of a small camel's hair pencil. Next, the cast is to be placed on the tile for baking it, in the usual way as practised in manufacturing porcelain. After the two portions have been taken from the furnace the last time, they may be ground on their inside surfaces where they may need it, in order to make them fit accurately a plaster bed or perfect representation of that part of the mouth which it is desired to fit. When the mouth to be fitted with teeth is of such a peculiar shape as to render it a difficult operation to remove the carved work from the matrix which faithfully represents it, as is sometimes the case with the upper jaw, the difficulty may be obviated in the following manner:—After the metallic plate has been accurately fitted to the mouth, it may be taken out and oiled on its inside surface. Next, with dentists' plaster, moistened to a convenient consistence, such portions of the oiled surface of the plate may be covered as shall most seem to interfere with its direct removal from the hardened mass of plaster, which is afterwards made to fill it; and it is well to divide into small separate pieces that plaster which is thus first placed in the plate, in order that it may be subsequently more easily removed from the work which is to be shaped and carved upon it. Next, when these plaster pieces have become hard, their outer surface should be thinly covered with bayberry tallow or its equivalent. The remaining portion of the oiled surface of the plate is next filled and covered over with a similar preparation of plaster. When this becomes hard it is also to be covered with bayberry tallow or the equivalent, and the tallow surface placed upon a thin bed of prepared plaster, confined to its place by means of a sheet iron form, as before spoken of. The plate may next be removed and the mould enlarged, and finished in the same way as the matrix before described.

"Some of the advantages of making sets of teeth in my way are quite apparent; for a half set thus, all solid and in one piece of material, will be in use a cleaner and purer job than those made in the usual way [viz., of gold metallic plate and teeth fitted thereto], there being no joints around the teeth made after my plan for the accumulation of foreign substances. They can also be afforded at an incomparably lower price than those as usually made, thus extending the benefits of artificial teeth to hundreds of persons who cannot afford them on gold or platina plates. In actual practice I find it is much easier to make teeth in this way, my method proving to be a great saving of time and labour. I have fitted several jaws, both upper and lower, with sets of teeth made on my improved plan, which teeth are now in daily use, answering every requirement. I do not claim the process above set forth. In making sets of artificial teeth, I do not claim the spreading of a gum enamel over one side of a metallic roof plate upon which the teeth are fastened, nor the extension of the porcelain gum some way and not entirely upon the roof; but what I claim as my invention is, the improved manufacture of whole or half sets of porcelain or mineral teeth, substantially as described."

Lapsed May 26th, 1857, at the end of three years.

1854. Walter Blundell.—For an improved apparatus for treating or preparing any part of the human body requiring to be surgically operated upon, for the purpose of totally or partially benumbing the sense of feeling at the desired part of the human body.

"My invention consists in the use and employment of an apparatus constructed upon the principle of an ordinary refrigerator, and the principal features of novelty of my said invention consist in causing a liquid, cooled by ice, or any known freezing mixture, to flow or circulate through a piece of metal, bladder, oil'd silk, membrane, or other material of suitable character, attached to the apparatus, said piece of metal or bladder or other material being employed in the manner and for the purpose hereinafter stated. It would be well here to observe that I am aware of a mode having heretofore been employed for benumbing the sense of feeling at any desired part of the human body, for the purpose of facilitating surgical operations and rendering them less objectionable than heretofore, and such benumbing operation has been partially effected by the application of a cold fluid to the part to be benumbed, for the purpose of absorbing the heat from such part. The objection to this mode of operating is, that as soon as the temperature of the cooling fluid becomes raised to that of the part to which it is applied, it ceases to produce any further effect until a fresh quantity of cooling fluid is applied, and therefore only partially benumbs the part, and does not, therefore, so perfectly effect the desired object. And I obviate this objection and render perfect the benumbing operation by so arranging and constructing the part which contains the cooling fluid, as that the said fluid is kept continually circulating through the same, and therefore has the effect of carrying off the heat from the part to which it is applied as fast as it is absorbed by the fluid, and thereby produces the desired benumbing effect most perfectly.

"In order to explain my said invention as completely as possible, I now proceed to describe the best means I am acquainted with for carrying the same into practical effect, reference being had to the illustrative drawing hereunto annexed, and to the numeral figures and letters of reference marked thereon respectively, as follows:—

In the absence of engravings I here give the patentee's verbal description of the apparatus, and mode of operating, from the PROVISIONAL SPECIFICATION.

"DESCRIPTION OF THE APPARATUS.

"I construct a vessel of gutta percha or other light waterproof material, into which I place salt and ice, or other known freezing mixture, the ice resting upon a perforated or inner false bottom, placed at a convenient distance from the lower part or outer bottom of the said vessel, thus forming a chamber, into which the freezing mixture passes as it becomes liquefied, and there is a cock affixed to the bottom of the aforesaid vessel for regulating the discharge of the liquid contents thereof, which pass through a piece of vulcanized india-rubber tubing, one end of which is securely fixed to the

aforesaid cock, and the other and opposite end of said tube is securely fixed to a small silver pipe; one end of this pipe is soldered to a circular flat piece of silver, the under side whereof has a screw or thread formed thereon, upon which fits a silver ring, and to this ring a piece of bladder (by preference the bladder from a rabbit) is securely fastened and made water-tight in any convenient manner. In some cases, however, I propose employing a piece of metal instead of the above-mentioned bladder, and upon the upper side of the before-mentioned circular piece of silver there is soldered one end of another short silver pipe, similar in all respects to that before mentioned, and to this last-mentioned pipe one end of a piece of vulcanized india-rubber tubing of smaller diameter than that before mentioned is affixed, and to the other and opposite end of said tubing a small silver cock is securely affixed, said cock being employed for discharging into any convenient receptacle the liquid from the vessel containing the freezing mixture. The mode of using this apparatus is as follows:—Supposing it, for example, to be used by a dentist, the operator opens the large cock and fills the bag with the freezing liquid; he then applies the bag to the tooth to be extracted, and pressing it against the gum at such part, holds it there, and opening the small cock slightly, allows the freezing fluid to flow or circulate through the bag, and thus carry off the heat from the particular part of the gum to which it is applied as fast as it is absorbed by the liquid, and it is this peculiar mode of absorbing the heat continuously which effects the perfect benumbing of the part to which it is applied, and thus constitutes this invention. It is to be understood that the coldness of the fluid in the bag will depend in a great measure upon the velocity with which it passes through the bag, which may be easily regulated by the operator pressing the tube between his thumb and fingers. The shape and size of the bag will also depend upon the purpose for which it is required, and must be constructed accordingly.

"I would here remark that as in practice I have found the above mode of benumbing the sense of feeling calculated in many instances to produce an unpleasant sensation to the patient, arising from the comparatively sudden application of cold to the part which is to be operated upon, I propose, therefore, to remedy this by constructing the apparatus upon the principle contained in a subsequent provisional specification of a patent, applied for by me, the said Walter Blundell, on the twenty-fifth day of November, one thousand eight hundred and fifty-four, and numbered 2,494.

"Having now described the nature and object of my said invention of an improved mode of treating and preparing any part of the human body requiring to be surgically operated upon, for the purpose of totally or partially benumbing the sense of feeling at the desired part of the human body, and in what manner the same is to be and may be performed, I would remark, in conclusion, that what I claim is, the use and employment of an apparatus constructed as above described, or any modified form thereof, so long as the same principle of construction is maintained, *i. e.*, the continuous flow of a liquid, cooled by ice or any known freezing mixture, into and through one or more pieces of metal, or bladder, or other material, so as to effect and maintain continuous absorption of heat from the part to which it is applied, for the purpose of benumbing

the sense of feeling at such part, as above more particularly described and set forth."

Lapsed August 11th, 1861, at the end of seven years.

1854. Samuel Stocker.—For certain coverings for various parts of the human body, with a view to the preservation of health.

This is not, properly speaking, a dental patent, although it has been so classed. It relates to, amongst other things, several forms of respirators, one kind consisting of strips of wire gauze or plates of metal, or other suitable material *faced with thin teeth*, and placed inside the lips. Lapsed September 5th, 1857, at the end of three years.

1854. Walter Blundell.—For an improved apparatus for treating or preparing any part of the human body requiring to be surgically operated upon, for the purpose of totally or partially benumbing the sense of feeling at the desired part of the human body.

EXTRACT FROM SPECIFICATION.

"My invention relates to certain improvements upon a former invention secured to me, the said Walter Blundell, on the eleventh day of August, one thousand eight hundred and fifty-four, under the Patent Law Amendment Act, No. 1758. Now, whereas I have since found in practice that the mode of operating, described in the specification of my previous patent, is not only limited in its application, but calculated in many instances to produce an unpleasant sensation to the patient, arising from the comparatively sudden application of cold to the part which is to be operated upon, I propose, therefore, by my present invention, to remedy this objection, and to enable the fluid cooled by ice, or any known freezing mixture, to be applied with equal effect in most cases by the use and employment of an apparatus (which I term a 'graduator'), so contrived and applied that the temperature of the part is gradually decreased from blood heat, or thereabout, until the desired benumbing effect is produced, and this I effect in the following manner and by the following means, that is to say:—Instead of allowing the cooled fluid employed to pass direct from the vessel which contains it into the flexible bag or other apparatus which is to be applied to the part to be benumbed, and to circulate through the same (as set forth in my said former specification of the eleventh of August, one thousand eight hundred and fifty-four,) during the whole of the operation; or in other words, instead of applying the cooled fluid in its intensely cold state at the commencement of the benumbing operation, the novel and peculiar feature of my said present invention consists in causing the cooled fluid to enter and pass through a vessel (which I call a 'graduator'), containing warm water or other suitable heated fluid or medium, before entering the aforesaid flexible bag, &c. By these

means, it will appear obvious that the commingling of the cooled fluid with the warm will have the effect of reducing the temperature of the one and raising that of the other, and this in a gradually increasing ratio; but since the cooled fluid as it passes through the graduator is continually displacing the warm water or other suitable heated fluid or medium, the effect will be to convey a gradually cooled mixture to the part to be operated upon. And I would observe, that as the length of time necessary for effecting such said gradual change of temperature will vary according to circumstances, it may be governed by regulating the rapidity with which the cooled fluid is allowed to pass through the graduator.

"Having thus described the nature and object of my said invention of 'an improved apparatus for treating or preparing any part of the human body requiring to be surgically operated upon, for the purpose of totally or partially benumbing the sense of feeling at the desired part of the human body, together with the best means I am acquainted with for carrying the same into practical effect, I would remark, in conclusion, that although I have described and represented a convenient form of 'graduator' for effecting the objects of my present invention, I do not intend to limit or confine myself to the precise form of such said graduator as above described and represented, so long as the principle thereof be retained; but what I claim is, the use and employment of a graduator in combination with the refrigerator (referred to in my former specification of the eleventh of August, one thousand eight hundred and fifty-four), for the purpose of decreasing the temperature of the part to be operated upon gradually from blood heat, or thereabout, until the desired benumbing effect is produced, as above particularly described, instead of applying the cooled fluid direct from the refrigerator to the part to be benumbed, as described in the specification of my former patent, dated the eleventh of August, one thousand eight hundred and fifty-four, No. 1758."

This patent is still in force, but may lapse, November 25th, 1861, at the end of seven years.

1855. John Haines White.—For an improvement in the method of applying artificial teeth.

ENTIRE SPECIFICATION.

"My improvement relates to such artificial teeth as are affixed to a palate, and applied without the aid of springs, and consists in producing a roughened surface thereon, constituting a number of small projecting points or burrs, for the purpose of gaining adhesion to the skin. This effect may be attained by a variety of ordinary tools, but a method I adopt is to use an instrument known to dentists as a sculpel, this being applied to the interior surface of the palate, pressed thereon, and caused to turn first in one direction and then in the other, will move along the surface and raise a series of projecting parts in a 'Vandyke' form. I then operate in the same manner at an angle to the former course, by which means the lines then produced are crossed, and the required effect attained; the general appearance of the surface is that usu-

ally termed frosted, but the resemblance thereto will of course vary accordingly as the raising is finer or coarser. The roughening may extend over the entire surface, or over a portion thereof only, and an indentation, such as is now used in 'vacuum palates,' may be combined therewith.

"Having thus described the nature of my said invention, and the manner in which the same is to be performed, I desire it to be understood that I am aware of palates having been engraved on the inside thereof with various devices, but such engraving has been of a different character to that above described.

"And I claim, as secured to me under the above in part recited letters patent, producing a roughened or burred surface upon palates or upon a portion thereof, for the purpose above set forth."

Lapsed February 24th, 1858, at the end of three years.

1855. Charles Goodyear, junior.—For improvements in the plates of artificial teeth.

ENTIRE SPECIFICATION.

"This invention consists of constructing the plates of artificial teeth of the hard product obtained by compounding india rubber or gutta percha (with or without other matters) with sulphur, and subjecting the same to a high temperature. For this purpose I take an impression from the mouth of the patient (in the manner usually practised by dentists) with wax or suitable plastic material, from which impression I take a cast in plaster of Paris. Upon this model I carefully adjust teeth of the form and size required, and in the position which I wish them afterwards to occupy in the mouth of the patient, using wax or other plastic substance to retain them in the proper position. I then spread a thin coat or layer of wax over portions of the model, of the form and thickness required, which layer of wax represents a model of the plate of caoutchouc which is afterwards to support the teeth and keep them firm in the mouth. When the crevices or cavities in or between the teeth are filled up with the wax, and the model of the plate completed, I take a plaster cast from the same, which cast I prefer should be inclosed in an iron rim or box for the purpose of strength. This, when completed, together with the original plaster model (which I also prefer should be in an iron rim), form a mould which I use in the following manner:—

"After removing the wax from the cavities and crevices in or between the teeth, I readjust the teeth in their proper positions in the mould. I then fill up the cavities and crevices and other vacant space in the mould with caoutchouc or gutta percha suitably prepared with sulphur, and after putting the several parts of the mould together, and subjecting them to a sufficient degree of pressure, I cause the whole, that is to say, the mould containing the teeth with the caoutchouc or gutta percha, to be subjected to heat, to convert the compound into the hard product. To obtain a suitable colour, I mix with the caoutchouc or gutta percha

vermilion, oxides of zinc or iron, or any colouring substance which will stand the necessary degree of heat with the action of the sulphur. The best compound I believe to be one pound of india rubber or gutta percha, or of the two combined in suitable proportions, with half a pound of sulphur, together with a suitable quantity of colouring matter.

"I sometimes find it convenient to substitute the material for the masticators or teeth hidden from view, for which purpose the material is well fitted from its extreme hardness and durability. In order that the teeth may be more firmly attached to the plate, I prefer that they should be jagged or rough, or have small cavities in the roots or parts imbedded in the plates.

"Having thus described the nature of the said invention, I have only further to state, that in thus making improvements in artificial plates and teeth of india rubber and gutta percha compounds, combined with sulphur, that whilst in the moulds I cause the materials and the moulds to be subjected to heat for about six hours, and in doing so I gradually raise the heat up to about 230° of Fahrenheit, say, in about half an hour, and then, unless there be a considerable quantity of foreign matter present, the heat may be raised as quickly as may be to about 295° of Fahrenheit; otherwise I raise the heat more slowly, and retain the compound at about that temperature for the remainder of the six hours, and then allow the whole to cool down, when the process will be completed. The artificial plates or teeth thus formed will then be ready to be trimmed and fitted.

"I claim the above-described manufacture of artificial plates and teeth."

Lapsed March 14th, 1858, at the end of three years.

(To be continued.)

NEW GUARDED ROSE DRILLS.

By S. C. GIBBONS.

HAVING experienced inconvenience in preparing large cavities in the masticating surfaces of molar teeth, when the pulp is covered only by a thin layer of softened dentine, with the enamel overhanging the walls of the cavity, I a few weeks since had made by Mr. Collins an oval rose drill, smooth and polished at the end, so that the enamel was readily cut without endangering the pulp. Finding that the conducting power of the metal in many cases produced pain, it occurred to me that the blunt extremity should be formed of ivory; this I have since had done. The serrations are cut parallel with the shaft of the instrument to prevent it screwing itself into (and, perhaps, splitting) the tooth.

70, Berners Street.

Hospital Reports and Case-Book.

SIMPLE ULCERATION OF THE TONGUE CAUSED BY A SHARP TOOTH.

(From the 'Lancet,' Nov. 9th, 1861.)

(Gur's HOSPITAL. Under the care of Mr. BRYANT.)

ALICE J—, aged fifty-three, applied for advice with an indurated, circular ulcer on the left side of the tongue, of two months' growth. She was a healthy woman, and no glandular swelling existed. The ulcer looked very indolent, and had a hard base; but the edges were not so everted as is seen in cancerous sores. There was a decayed tooth at the spot, with a sharp front, which appeared to irritate. Mr. Bryant, regarding this as a simple sore irritated by a tooth, ordered the sharp point to be filed down, and chlo-

rate of potash to be taken internally, and also applied as a lotion. On the third day the ulcer began to heal, and in a week it was well.

TEETH KNOCKED OUT AND RE-INTRODUCED.

(From the 'Lancet,' Nov. 2nd, 1861.)

A MAN entered the Westminster Hospital in March last, and stated that he had had three of his teeth knocked out in a fight. On examining his mouth it was found that he had lost his three upper incisors, which he brought with him. Mr. Slater tied them in with silver wire, and in ten days two were quite tight, the other would not stop in.

British Journal of Dental Science.

LONDON, NOVEMBER, 1861.

IN theatrical affairs no stage manager would be foolish enough to allow the performers to play their parts without paint:—there must be a certain amount of rouge and pearl-powder, to give effect to the countenance, and command the admiration of the public. It would be considered equally remiss in him to leave the dressing-room door open, so that the general eye could witness the process of disguising which takes place in those odd little nooks and corners,—and we may add, that it would not answer the proprietor's purpose to admit his auditory behind the scenes, or permit them to witness how things were managed on the other side of the curtain. The public must be content to see the performance from their proper places, and remain in ignorance as

to *how* the whole thing is "got up." It is so, likewise, with other matters besides theatrical representations. When a new company starts into existence, it is brought before the public without a flaw,—and, if possible, with the extra advantage of a warm eulogy from the press. By resorting to these and similar means it is expected to "take," and the fewer questions challenged as to the method and motive of its production perhaps the better—*i. e.*, for the company in question.

We are reminded of these common truths by the appearance in the 'Morning Advertiser' of the report of the opening of a new Dental Hospital in Portland street, which event took place on Monday, 11th instant. As an addition to the ranks of our charitable

institutions we have only to say that it has our best possible wishes, and, in so far as it may be the means of aiding the many thousands of the metropolitan poor, who are unable to pay the fee of a skilful practitioner, our hearty approval. Nor do we for a moment demur to the use which may be made of it for the purposes of education—for, if the requirements of the poor in a city which contains three millions of inhabitants, demand two dental hospitals, we think that the rising generation of dentists may very fairly ask for two schools of dental surgery, for the better qualifying themselves in their profession. With the hospital in Portland street, therefore, we have no cause for disagreement—but we cannot say as much for the means employed to make it known to the public at large. The whole proceeding, to the eyes of those who are acquainted with the principal actors in it, is so perfectly transparent, that, however things may appear to others, the motives which have led to the establishment of this institution, and the spirit of which it is an exemplification, are, to *them*, as clear as the sun at noonday. We are told that the College of Dentists always intended to establish a Dental Hospital—as a thing much wanted both for the profession and the public. If so, surely they had no cause of complaint when others in the profession (although not connected with them) accomplished this object. We have not forgotten, however, the envious remarks which appeared in the College journal of that time on the subject—and on referring to them in order to see how the counsel therein given is now acted upon, we find the usual contradiction which characterises the sayings and doings of the College of Dentists.

Speaking of the Dental Hospital of London, or rather of its printed prospectus, the 'Quarterly Journal of Dental Science' says—"We cannot help thinking that an ostentatious display of Vice-Presidents, &c., will be

looked upon as a vulgarity. It is not usual in the great metropolitan hospitals to make so great a parade of names, and the committee will do well to see that they do not over-play their part." On comparing this gratuitous statement with the extracts which our readers will find in a subsequent page, we are compelled to conclude that the gentlemen in question have changed their opinions, as to the "vulgarity" of such public announcements. This, however, might have passed for what it is worth, had the "management" so arranged that the editor of this same journal should not *contradict his own report*—or at any rate the report in his own pages—and even this latter fact would also have stood for little in our estimation, had not the remarks of the editor been so egregiously incorrect. In direct opposition to the truth, however, and to the admission made in the opening words of the report, it is stated, that for the relief of acute suffering such as dental diseases produced, "no provision whatever has hitherto been made."!! This, we are glad to find, called forth from the Honorary Secretary of the Dental Hospital of London, a letter of correction and complaint—but which, for reasons easily divined, the 'Morning Advertiser' refused to publish.

We hope that the promoters of this institution will be satisfied with the publicity given to their names as a body—but cannot help thinking that the worst enemy of that gentleman who is so unsparingly bedaubed with the adulations of the editor of the 'Morning Advertiser,' could not have wished to see his name in a more unfortunate position than it occupies in connection with those remarks. In conclusion, we would say, that, while we wish well to the National Dental Hospital, we think it a pity, for their own sakes, that the drop-scene which was meant to screen the actors in this drama from the public eye, was not made of a thicker material than gauze.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

THE DENTAL HOSPITAL IN PORTLAND STREET.

*To the Editor of the 'British Journal of
Dental Science.'*

32, Soho Square, W.;
November 14th, 1861.

Sir,—I enclose you a copy of a letter which I forwarded to the editor of the 'Morning Advertiser' on the subject of Dental Hospitals, as a correction of that person's erroneous statements. As the letter was not published in that paper, I beg you will be good enough to allow it to appear in your journal; and I would also draw the attention of the profession to the accompanying statement by D. J. Brady, Esq., at the inauguration of the Dental Hospital in Portland street. The concluding paragraph in the report of that meeting needs no comment of mine, as I believe your readers will agree with me that it tells its own tale.

I remain, Sir,

Yours faithfully,

ALFRED HILL.

DENTAL HOSPITALS.

To the Editor of the 'Morning Advertiser.'

32, Soho Square, W.;
November 14th, 1861.

Sir,—My attention has been called to a statement which appeared in your journal of the 12th inst., respecting the inauguration of a Dental Hospital in Portland street, which statement runs to the effect, that for those persons who suffer from affection of the teeth "no public provision whatever has hitherto been made." I am compelled to offer a few remarks thereupon in order to correct this totally erroneous assertion. In December, 1858, the Dental Hospital of London was publicly inaugurated, and from that time has been in uninterrupted operation for the benefit of those very persons who you remark are afflicted with "one of the most acute kinds of suffering to which our nature is subject." During its first year 2116 patients sought

and obtained the benefits it had to bestow. The second year 4612, and up to the present time, in this the third year of its existence upwards of 6300; making a total of 13,028 patients in not quite three years. On the 23rd of May, 1860, the Hospital, and the London School of Dental Surgery attached to it, were officially recognised by the Royal College of Surgeons, and since then the hospital has been honoured with the presidency of His Royal Highness the Duke of Cambridge. Even the report in your columns of the inauguration of the Dental Hospital in Portland street states, that "at the present time only one similar institution exists in London, which has been productive of much good." I am at a loss to know why you should so completely ignore the existence of so well known and valuable an institution as the Dental Hospital of London, more especially as the gentleman to whom you allude in your remarks (Mr. Robinson) is in the position to inform you fully on the subject; he having been a trustee up to the end of last year, and was fully acquainted with its working. I rely upon your proper sense of justice not only to insert this letter, but to assign to it an equally conspicuous position in your earliest impression as that which your remarks occupied.

I am, Sir, yours, &c.,

ALFRED HILL,

Hon. Sec. to the Dental Hospital of London.

ESTABLISHMENT OF A DENTAL HOSPITAL.

(From the 'Morning Advertiser,' Nov. 12th, 1861.)

WE refer in this prominent part of our paper to the report, which we give in another part of our impression, of the opening, last night, of a Dental Hospital, because we feel, in common with a large portion of the community, that such an institution was a great desideratum. For almost all the other ills to which flesh, and we might add "bone," is heir, the Christian benevolence of the country has provided suitable institutions; but for tooth-

ache—one of the most acute kinds of suffering to which our nature is subject—no public provision whatever has hitherto been made. Through the exertions of several members of the dental profession this very urgent want has at length been supplied. And in thus alluding to those to whose benevolent efforts we owe the existence of the Dental Hospital in Portland street—last night so auspiciously inaugurated—it would be a great and grievous omission did we not especially refer to the services of Mr. Robinson, the eminent dentist, of Gower street. That gentleman has laboured with untiring zeal, and with a resolution which no discouragements could diminish, in carrying out the benevolent object on the accomplishment of which his heart has been so long set. And we speak advisedly when we say that he has been as lavish of his money as he has been liberal in the expenditure of his time and labour, in bringing to the triumphant result which was last night witnessed his desire to see an institution accessible to the poor, without any charge, in which immediate relief to dental sufferings may be afforded them. No wonder, then, that the room rang with the plaudits of the meeting when the chairman so emphatically referred to the extraordinary efforts which Mr. Robinson had made, and the unwearied zeal he had shown, in carrying out his humane determination to see a free Dental Hospital established in the heart of this great metropolis. For further details respecting the inauguration of last night, we must refer to the report of the proceedings given in another part of our paper. The Dental Hospital will be entirely dependent for its support on voluntary contributions, but these the committee of management may rest assured will not be wanting in so meritorious a cause as that which we this day bring before the public in so practical a shape.

Extract from the speech of the Chairman, D. J. Brady, Esq., M.P., at the Inauguration of the Dental Hospital of the College of Dentists, from the 'Morning Advertiser,' Nov. 12th, 1861.

"It was a wonder, only some years ago, to find a practitioner who could tell the number of teeth in a man's head, during the time of the jaw-breaking key. Up to that time there had been little progress made in the science of dentistry; but in the short space of six years there had arisen a body of gentlemen who were wise in their generation, who thought it was necessary that such a stigma should

not be allowed to remain upon the profession at large, and they boldly banded themselves together to establish a Dental College. (Cheers.) That Dental College had already led to great and beneficial results. That College was presided over by men of intellect, who thoroughly comprehended the importance of their profession, and knew well what they were about. The most important result from that society was practically demonstrated in the meeting this night."

Concluding paragraph in the Report.

"Amongst the foremost of those in the Dental profession who have laboured hard for its improvement, and the foundation of the Hospital, may justly be named Messrs. Robinson, Rymer, Hulme, Waite, Hockley, Vidler, and Kempton."—*Extracted from 'Morning Advertiser,' Nov. 12, 1861.*

PORCELAIN IMPRESSION TRAYS.

To the Editor of the 'British Journal of Dental Science.'

SIR,—Allow us to call your attention to a letter by Mr. Felix Weiss to the 'Dental Review' of this month, relative to the porcelain impression trays introduced by Mr. Rutterford at the last conversazione of the College of Dentists. As we are the manufacturers of the porcelain impression trays in question, we beg most respectfully to thank Mr. Felix Weiss for all he has said favorable to our invention, viz., that the profession must regard it as a very desirable addition, but he adds, were it not for the breakages, they might be considered perfect, and concludes by suggesting the manufacture of glazed iron for this purpose. As regards the fragile property of porcelain, we submit that the same disadvantage is attended to the use of porcelain of any description or configuration, and we would ask, can it be anticipated that, even for ordinary domestic use, iron can possibly supersede porcelain? Certainly this has been tried in plates, &c., but has been found a failure, the extreme lightness of porcelain, compared intrinsically with iron, is a material advantage, and there is no doubt that glazed iron impression trays would suffer as much through carelessness of assistants as the pewter ones; and even with the greatest care, as the trays have to be subjected to heat, expansion of the iron takes place, and the superficial covering of glaze splits in all directions, and then the unsightly iron appears. This objection was substantiated on the introduction of iron plates. A small portion of the glaze breaking away or cracking,

would render the dentist's impression tray far more offensive to the eye of his patient than a cracked or damaged plate, the former having to be placed rather nearer to the organs of taste than the latter, and it must be admitted that we ought to patronise cleanliness and neatness in our operating-rooms; and would it not be folly to sacrifice these superexcellent considerations because the carelessness of our assistants should cause occasional losses? And to meet this the price of our trays has been fixed at a very low figure, considering the expenses incident upon introducing something new. We can answer for the trays being abundantly strong enough for any amount of pressure required for taking an accurate impression, and there is also considerable saving of time realised in separating the wax from the tray, combined with less loss of material. We have had several letters from dentists speaking of their superiority over the old pewter ones, and we have no doubt they will soon become universally used and appreciated by every one who values neatness and cleanliness beyond the consideration of occasional loss by accident or otherwise.

Yours obediently,

CRAPPER AND BRIERLEY.

White House, Stanley,
Staffordshire.

To the Editor of the 'British Journal of Dental Science.'

SIR,—In an article in your last Journal, there is some deservedly flattering account of the things supplied by Messrs. Ash, and I should not trouble you with any comment, had the writer not regretted that there existed one *desideratum* in mineral teeth, viz., tube teeth of the natural pattern. Now permit me to say, that the Messrs. Smale have for some time manufactured the very kind of teeth, and from a recent inspection of them, I can pronounce that they are so natural, that it requires some experience not to regard them as absolutely human teeth.

I am, Sir,

Your Constant Reader,
AN OLD DENTIST.

St. John's Wood;
November 14th, 1861.

To the Editor of the 'British Journal of Dental Science.'

SIR,—On looking through some recent numbers of the 'Lancet,' I observed the following passages, which I have extracted and now send to you, as they tend to show how correct you are in your estimate of the unprofessional practice of advertising. Trusting you will not flag in your praiseworthy endeavours to uphold the dignity of our profession,

I am, Sir,

Yours faithfully,

EXCELSIOR.

ROYAL COLLEGE OF SURGEONS IN
IRELAND.

(From 'The Lancet,' Nov. 9th, 1861.)

At a recent meeting of the Council, the following ordinance was passed:—"No Fellow or Licentiate of the College shall pretend or profess to cure diseases by the deception called homœopathy, or the practice called mesmerism, or by any other form of quackery; neither shall they, or any of them, seek for business through advertisements, or by any other disreputable method. It is also hereby ordained that no Fellow or Licentiate of the College shall consult with, meet, advise, direct, or assist any person engaged in such deceptions or practices, or in any system or practice considered derogatory or dishonorable by physicians and surgeons."

UNPROFESSIONAL ADVERTISEMENTS.

(From 'The Lancet,' Nov. 9th, 1861.)

To the Editor of the 'Lancet.'

SIR,—Herewith I beg to forward you the advertisement of a member of our profession, which appears weekly in the 'Ilfracombe Arrival List.' I happened to be staying in the neighbourhood, and was much surprised by being asked whether it was customary for *gentlemen* of my profession to place themselves on the same footing with tradesmen, whose advertisements accompany Mr. Jones's.

Yours faithfully,

M.D., M.R.C.S., &c.

Plymouth; Nov., 1861.

"Mr. Jones, Member of the Royal College of Surgeons, and Licentiate of the Apothecaries' Hall, 23, High-street, Ilfracombe, takes leave to inform visitors and the public generally that, in addition to his general practice, he performs every operation in surgical and mechanical dentistry on the most approved and scientific principles."

In the "Answers to Correspondents" of the 'Lancet,' November 2nd, 1861, the following appears:

A DENTIST.—If our correspondent desires to read some good remarks upon the nuisance of the advertising system, let him refer to the 'British Journal of Dental Science' for the present month (No. 64, vol. iv, p. 273).

Dental News and Critical Reports.

ODONTOLOGICAL SOCIETY.

November 4th, 1861.

THIS Society held its first meeting for the session 1861-2, at its Rooms, 32, Soho Square, on Monday, November 4th, 1861, W. M. Biggs, Esq., President, in the chair.

The PRESIDENT.—On resuming our monthly meetings, I take the opportunity of congratulating the members of the Society upon the very satisfactory character of the papers which have been furnished throughout the past session. They have called forth discussions and observations from gentlemen whose experience and practice in their profession entitle them to respect and consideration. Let me urge on all present the necessity of continuing to contribute such papers. I think we shall thereby carry out the objects for which the Society was instituted. If we have papers they will necessarily excite discussion, and diffuse that knowledge of dental surgery which we are all anxious to establish among us. I trust that there will be abundance of papers this session; and I have no doubt, from all I have heard, that we shall be gratified in this respect. I may likewise call the attention of the meeting to our library and museum. We have very few books, and all must be aware that a good library is a desideratum, without which we cannot hope to get on satisfactorily. The council is taking the matter into consideration, and I trust that ere long we shall be able to give some report on the subject which

will be gratifying to all of us. The museum also claims your consideration. If any gentleman should have objects for presentation, we shall be most happy to receive them.

The minutes of the last meeting having been read and confirmed—

The following gentleman having been balloted for, was then announced as an elected member—Mr. William Fisher, 13, Crescent, Taunton, Somersetshire.

The name of the following gentleman was then announced as a candidate for election as member of the Society—Mr. Henry Campion, 305, Oxford Road, Manchester.

The following contributions to the library and museum were then announced, and the thanks of the Society accorded to the respective donors:—

By Samuel Ghrimes, Esq.

Dried preparation, exhibiting dissection of nerves and blood-vessels of the teeth.

Ditto ditto second dentition.

Skull and lower maxilla of spaniel.

Ditto ditto of another dog.

Ditto ditto of cat.

Ditto ditto of osprey.

Ditto ditto of guinea pig.

Ditto ditto of American squirrel.

Ditto ditto of hedge-hog.

Ditto ditto of rabbit.

Ditto ditto of hare.

Skull of tortoise.

Two elephant's teeth.

Section of ditto, showing laminæ of enamel.

Interesting case of exostosis in tooth of walrus.

By Walter Campbell, Esq., of Dundee :—An "Articulator," of which the following description was read :

This articulator is only necessary when there are no antagonizing teeth in the mouth. The advantages obtained by this instrument are the following. By it the bite can be lengthened or shortened, from that taken in the mouth, and still correspond to the opening and shutting of the jaws.

The models can be taken off, and put on again in two or three seconds, so that with one articulator, two or three dentures can be gone on with at the same time, and the same bite may be referred to at any future time, should a duplicate be wanted, or the original piece require repairing.

The advantage given by the articulator with the forward and backward motion, is not great, it should seldom be needed. before transferring the bite to the articulator, the operator should be pretty sure that it is correct, but it will occasionally happen that the operator fears that the under jaw of the patient was a little too far out when the bite was taken. Having transferred the bite to the articulator in the usual way, he will again try it in the mouth, —and his doubt may be realised—when all that he has to do is simply to slacken the screw and push back the under part of the instrument until it corresponds to the position in the mouth.

The india-rubber washers on either side of the joint, give a near approach to the grinding motion of the jaws without rocking in any degree.

The method of transferring the bite to the articulator is as follows:—Cut a shallow cavity in the upper model a little wider at the bottom than at the top, about three quarters of an inch or an inch square at the bottom; place the model on the table, bottom uppermost, rest the square of the upper limb of the articulator over the cavity, so that the median line of the model will coincide with the line of the upper limb of the articulator; lay the pin over the square in the groove, holding it *in situ*, by the thumb of the left hand; pour a thin batter of plaster into the cavity, over and above the pin, till the plaster is about an inch above the square. When set, trim off the plaster above the square, so as to allow of the removal of the model. Then place the bite with its corresponding plate—gold or gutta-percha on the upper model, place the under model (having had a cavity previously cut

in the bottom) upon its corresponding plate, turn over the under part of the articulator to the bottom of the under model, place the pin in the groove, and pour a batter of plaster into the cavity, and finish in the same way, as in the case of the upper model.

When a complete upper denture is wanted, my method of obtaining the antagonizing model is as follows:—an impression of the under teeth is taken along with that for the upper jaw, from which plaster models are made in the usual way. The gold plate is then struck up—or if for vulcanite, the gutta-percha plate is adjusted—with a rim of wax sufficiently broad to receive an impress of the under teeth, then cut away until all the teeth touch the wax at the same time. The wax may then be crossed over the flame of a spirit lamp, so as to soften the surface, and again placed in the mouth, the patient at the same time being directed to close his jaw naturally—until the *points* of the lower teeth make an impression in the wax. This done, the models are to be adjusted to the articulator with plaster, as before directed; with this difference that the teeth of the under model are to be gently pressed into the impression made in the rim of wax by the corresponding teeth in the mouth, then fix the under model to the lower part of the articulator with plaster as before.

The PRESIDENT.—If any gentleman has any casual communication to make, we shall be very pleased to hear it.

Mr. CHARLES JAMES FOX.—I have a very small matter to introduce to your notice, which I have found useful in my own practice. It is a gutta-percha rack for instruments. Wooden racks are liable to break between the notches, and brass ones require much time and labour in adapting them. These you can readily cut in the operating-room yourself. Mr. Rutterford has carried out the idea for me, and has done it, I think, very efficiently. There are one or two racks on the table, cut so as to show how they can be adapted to various-sized instruments. You will find they can be cut very readily with a pen-knife, and may be used even in arranging specimens of teeth, or anything of that kind.

(The specimens were handed round.)

Mr. OWEN.—I have thought, sir, that it might not be unacceptable to the members of this Society if I brought down

to it "a plugging-table," and also an instrument case, both which I designed to meet the requirements of my own operating-room. They are now made for the profession by Messrs. Ash, after my patterns. The object of the table is that we may have all the *materials* for foil-plugging in as compact a form as possible, and capable of being placed in any convenient situation within reach, and of being closed and locked with facility. This lower tray, which revolves, has several compartments for gold and tin foils in every needed form, for scissors, amadou forceps, amadou, waterproof sticking-plaster, &c. &c. The upper table is for laying the instruments upon for immediate use; the little box in the centre has a cushion to facilitate the taking up of the foil or the point of the plugger. When not in use, the upper tray closes down upon the lower, and is then locked.

The object of this instrument case is that instruments may be presented in as large a number as possible to the hand upon opening it; its length is two feet nine inches, width nine inches, depth four inches. It is intended to stand upon the table behind the operating-chair. There are three tiers of compartments for instruments. In the lower one the extracting-forceps are arranged, and are entirely hidden. Then there are two trays above them, each one third the length of the case. These slide from end to end of the case. Two other and similar trays slide over them at the top, so that you may have—in fact you must of necessity have—the whole area of the case easily presented to the hand, every part of each tier of instruments being perfectly accessible as the trays are slid about.

Mr. TOMES then read the paper, of which the following is a very full abstract:

On Certain Conditions presented by Amalgams used in Filling Faulty Teeth.

THE unqualified condemnation of amalgams on the part of some, and the confidence reposed in mercurial fillings by other, dental practitioners, is a sufficient indication that the question has not received that amount of investigation which its importance merits. We meet with cases in which teeth filled with amalgam have lasted for fifteen or twenty years, indeed, until with the advanced age of the patient, the teeth have loosened and fallen out. But far more numerous are the cases in which the pre-

sence of the amalgam fillings have failed to arrest for any considerable time the destruction of the teeth. With opposing opinions and inconclusive results, it is incumbent on those who regard the use of amalgams with unqualified disapprobation to show the grounds upon which their condemnation rests; we should be told why amalgams fail to preserve the teeth into which they are introduced; and it should be clearly pointed out that the conditions necessarily involved in the use of these mercurial compounds are such as must secure an unfavorable result. On the other hand, those who advocate the use of amalgams should be able to point out why the unfortunate so far outnumber the successful cases. Why, in one case, an amalgam filling preserves a tooth for an indefinite time, while in another case the disease is arrested but for a few months. To say that these differences in the results depend upon accidental causes is but to admit that we are unacquainted with the conditions the presence or absence of which will determine in each case the success or failure of the treatment.

In cases of failure it is not enough to condemn the material used in the treatment, unless it is at the same time shown that the employment of other materials would have led to a successful issue. Dental surgery has arrived at that point when mere opinion, unless supported by clearly stated evidence, cannot be accepted as a guide for practice. To analyse one by one all the conditions attendant upon the operation of plugging a tooth, and those to which the tooth is subsequently exposed, is by no means a simple or an easy task. The recognition of a difficulty is, however, in many cases, the first step towards its solution, and although we may be unable to acquire a perfect knowledge of our subject, yet we may, and no doubt shall, make great advances from the point at which we at present stand. The rate of progress will, I feel sure, be hastened by our devoting ourselves to the investigation of special points, which, after being worked out by individuals, should be brought before this Society for free and ample discussion. With this feeling I undertook to prepare for the Society a paper upon the physical conditions presented by the different materials used in filling teeth. I did so with the hope of throwing some further light upon the use of amalgams, but more especially with the hope of inducing others to take up, for the purpose of close investigation, this and other points of practice.

To treat of amalgams satisfactorily, it would be necessary, in the first place, to consider the different amalgams as chemical compounds, both as respects the substances used in compounding each amalgam and the proportions of the several ingredients. I, in common, I believe, with many others, purchase and use materials prepared by Messrs. Ash or those of other makers, without knowing the proportion the incorporated metals bear to each other. Whether definite proportions exercise an important influence in these compounds, in which mercury plays so singular and important part, I am unable to determine; but the fact that in certain alloys the proportion in which the ingredients are combined will determine whether a chemical combination, or a mere mixture, results, indicates that the question of proportions should be fully investigated.

The consideration of proportions will involve the investigation of the nature of the process by which the hardening of the compound is effected. It is usual to state that this process is one of crystallization, but I am not aware that any one has shown that crystals are formed. Whether an amalgam in hardening either expands or contracts is also a question of great practical importance, and the character of surface retained by the mass when its induration is complete cannot be neglected. It is to the investigation of these latter points that I have directed my attention. The experiments instituted have been confined to the amalgams in general use, with the view of ascertaining the merits of well-known compounds, and of making them the basis of comparison in the examination of combinations which may at a future time come under our notice. But even here, at the very threshold of a very simple inquiry, we are, most of us, met by the difficulty of ignorance. We are, for the most part, dependent for our supplies upon those who prepare amalgams for sale, and who, in the interest of their trade, do not proclaim the formulas they follow. We are, in fact, daily using amalgams, concerning the ingredients of which we have no precise knowledge. To each of these imperfectly known compounds we attach the name of their respective makers—a custom which, in itself, shows pretty clearly that we are not proceeding upon very scientific principles—that we trust to the knowledge of the compounder, who is unacquainted with the results of practice rather than to our own knowledge, both for the determination of the ingredients used, and of the relative quantities

of the component parts. In conducting the experiments, the results of which I am about to lay before the Society, the following plan has been adopted. Slips of ivory have been prepared, the size of each being similar excepting in a diminished width to the ordinary glass slide used for mounting microscopic preparations. Each ivory slide is perforated through its centre by a perfectly cylindrical hole. When about to be used, the slide is firmly clamped down upon the flattened surface of a block of ivory, by the assistance of which the cylindrical perforation is converted into a cylindrical cavity—having a perfectly flat floor lying at right angles to the walls. On the under surface of the slide several minute angular fissures have been cut into the edge of the wall of the cavity by a very small four-angled file. This expedient has been adopted for the purpose of testing the readiness with which the amalgams used enter minute fissures.

The amalgam has been introduced with ordinary care, and forced into the experimental slide with a round headed burnisher sufficiently small to enter with readiness the cavity.

When the amalgam has perfectly hardened the clamp is relaxed, and the slide withdrawn from its position on the block of ivory, thereby exposing for examination that portion of the plug which rested upon the floor of the cavity, together with the fissures in the walls produced by the file.

The amalgams in general use may for convenience be arranged into two groups. Those which are combined with mercury as a preliminary proceeding, the mass being softened by moderate heat, and the excess of mercury squeezed out prior to the introduction of the plastic mass into the tooth. And those which are completed by the addition of the mercury to metallic filings at the time of use. Of the former kind, I am aware of two varieties only. The one formed by the solution of pure copper in mercury; the other Sullivan's cement compounded, it is said, of copper mainly. Each of these have been subjected to the experimental test already described, and with the following results. In test slides Nos. 1 and 2, the amalgam when it has hardened in contact with the ivory forming the bottom of the cavity presents a fine granular surface. It has failed to penetrate into fissures extending from the sides of the cavity in the one slide, and in the other it has separated from the wall of the cavity.

In neither slide is the cavity fully and entirely filled. The microscope shows that the plug is in neither case perfect. In slide No. 3, the pure copper and mercury was introduced. The process of hardening has not in this case been attended either with the same amount of contraction, or of change of surface, as in the preceding specimens, in which Sullivan's cement was used. Indeed, this specimen exceeds any other I have examined both in respect to the smoothness of surface it preserves, and to the closeness with which, after hardening it is applied to the surface of the cavity in the ivory slide. In slides Nos. 5 and 6 an American amalgam, sold by Messrs. Jameson, of Glasgow, was employed. This compound has hardened in contact with the ivory, with a very rough, granular surface, and the mass has obviously contracted, so that had the surface been such as when closely applied to the walls of the cavity would have served to exclude the ingress of moisture, the general contraction would have rendered that property useless. In each case the filings were carefully rubbed with the mercury in a mortar, and the mass when perfectly incorporated was previous to introduction washed with ammonia.

In preparing slide No. 8, the filings sold by Messrs. Ash, were incorporated with mercury in a mortar, the mass washed in ammonia, and then after the expression of the superfluous mercury introduced into the test slide. The result is a plug presenting a fine granular surface where hardened in contact with the ivory, and a considerable amount of separation from the walls of the cavity; the obvious result of contraction.

In slide No. 9, the same materials were employed, but the combination was effected by rubbing the filings and mercury together in the palm of the hand. The washing was also omitted. The result due to the difference of manipulation is a plug presenting a much rougher and more granular surface than No. 8. It is separated from the walls of the cavity; and the mass has failed to enter the fissures prepared to test its powers of penetration.

Slide No. 10, contains an amalgam furnished to me by Mr. Jameson, and consists of the following ingredients: tin 10½ dwt. silver 1 oz., gold 1 dwt. The filings were incorporated with the mercury in a mortar, and subsequently washed with ammonia, the excess of mercury squeezed out, and the mass introduced into the cavity in the manner described. The bottom of the

plug showed a broken and granular surface, and an incapability of penetrating into minute fissures.

Specimen slide No. 11, contains a plug introduced by our treasurer Mr. Rogers. It consists of pure palladium and mercury, the two metals having been combined by friction in a mortar. In this plug, there are obvious indications of contraction. I am indebted to Mr. Rogers for a second specimen No. 12, in which the results are more satisfactory; but in this, the metal has not penetrated into all the fissures. The surface presented by each of the palladium plugs is very finely granular, but not in this respect superior to the copper amalgam.

In producing the specimen plugs, the operation has in each case been conducted with care, and the results are quite as favorable as would have been obtained in the course of practice. Having discovered the difficulty of forcing an amalgam into minute fissures, I might by specially directed efforts have obtained more successful results, but my object has been to test the qualities of the several compounds when employed in the treatment of carious teeth, with the usual amount of care. I may mention that if an excess of mercury be retained with a view of rendering the operation more perfect, the failure will not be less pronounced. The mercury will be squeezed out into the fissures, leaving the solid metal behind. Again, if the mass be deprived of mercury, so to render it crumbly, the surface of the resulting plug where resting against the walls of the cavity, will be broken and irregular.

My investigations up to the present time, lead to the conclusion which an examination of the specimens before the society will, I think, fully justify, that our present knowledge respecting the compounding of amalgams suitable for dental purposes, is in a very unsatisfactory state. Take, as an example, the two specimens of palladium plugs; in each of which, the composition is supposed to be similar, while owing, perhaps to slight differences in the manipulation, or to the quantity of mercury used a want of uniformity in the results has been produced. Again, a plug produced by rubbing mercury with the filings prepared by Messrs. Ash, in the palm of the hand, varies considerably from another in which the mercury and filings were thoroughly incorporated in a mortar, and the mass washed with ammonia. When the uncertainty in the character of an amalgam plug is admitted, and the

difficulty in forcing the metallic paste into fissures or minute angles is acknowledged, we need not, I think, be at a loss to account for the difference of opinion which prevails respecting the durability of amalgam plugs generally, and respecting the comparative excellence of the several kinds of amalgams.

There are those who prefer before all others, the pure copper amalgam, and if regarded for its physical properties only, it unquestionably stands in the foremost rank; but the black colour it assumes and imparts to the tooth, and the strong metallic taste its presence in certain cases establishes, justify its condemnation; still, notwithstanding these objectionable qualities, I doubt whether we should be able to find amalgam plugs, which have preserved teeth for a greater number of years than such as have been composed of copper and mercury. A palladium plug if produced under the most favorable circumstances, is in its physical characters equal to one of copper, and the great superiority in its chemical character, place this amalgam at the head of the list. At the present time, the metal is so rare that its general use even in the quantity which might be required for dental purpose is prohibited. So far as my own limited experience has gone, the qualities of the samples furnished have varied. In some cases, the mass has hardened with such rapidity, that an insufficient time has been allowed for its introduction into the tooth; in other specimens, the hardening process has extended over some hours—a variation suggestive of differences of composition.

I rarely use amalgams in teeth which admit of the introduction of a gold or tin-foil plug; in other words—in teeth which afford a reasonable chance of preservation, and in the treatment of which the qualities of the material used would be fairly tested. Although my experience in the use of amalgams is limited to the results obtained in the treatment of unpromising cases, I am fully prepared to support the opinion that these compounds are of great practical value. The issue of the experiments I have laid before the Society, points to sources of failure, and at the same time affords satisfactory evidence in favour of the impression, that a more accurate knowledge of the properties of these metallic compounds, and a more careful manner of use would greatly increase the value of amalgams in the practice of dental surgery. I hope to bring before the Society, a continuation of these observations, and trust the members

will consider the subject sufficiently important to engage their attention in the investigation, and that they will be induced to institute experiments, both as respects the properties of amalgams, and the best methods of using them. Our efforts should in the first instance, be directed towards the production of a metallic paste, which will receive and retain after hardening, a perfect counterpart of whatever surface it is pressed upon. It should have no surface granular or otherwise peculiar to itself. It must be free equally from contraction and expansion during its gradual induration; and in addition to these properties, it must resist such chemical agents as may be applied to it in the mouth.

It is possible that the materials at present in use, may under certain conditions of treatment combine all these properties. If so, these conditions are not generally known. It remains for me to tender my thanks to those gentlemen who have kindly furnished me with specimens for experimenting upon, and to state that those preparations upon which I have made no report, will receive my attention on a future occasion.

At the conclusion of the paper Mr. Tomes said,—I have brought a microscope with me, and also the different slides the plugs in which have been described in the paper. After the meeting I shall be happy to show the preparations, so that the members may judge for themselves as to the results which have been obtained. (Applause.)

The PRESIDENT.—Gentlemen, a more important subject than that which Mr. Tomes has brought before us this evening could not have been selected, and I only hope his example will lead other gentlemen to communicate their experience. I have no doubt there are those present besides Mr. Tomes who have given attention to the subject, and we should be glad to hear the result of their experience.

Mr. OWEN.—I should like to ask Mr. Tomes whether the specimens of palladium amalgam he tried were made with pure palladium or with the ordinary palladium of commerce.

Mr. TOMES.—I must ask Mr. Rogers.

Mr. ROGERS.—I am unable to speak positively upon that point. I think it was the simple palladium of commerce, purchased at Johnson and Mattley's. I have always understood it to be the oxide of palladium.

Mr. OWEN.—Was it in the metallic form or the precipitate?

Mr. ROGERS.—In the form of a precipitate.

Mr. OWEN.—Commercial palladiums contain a very large proportion of silver, the variableness of which in different samples may account for the differences in the length of time required for their amalgams to harden. I think one specimen which I procured from a highly respectable house consisted of three fourths of silver and one fourth of palladium.

Mr. TOMES.—I think the palladium I used cost about eight guineas an ounce.

Mr. T. A. ROGERS.—The price varies. It has varied since I can remember from five and a half guineas to eight guineas an ounce.

Mr. HARRISON.—I should think, sir, that the palladium in question would be found to be pure palladium. I remember, when I used the palladium amalgam, I was in the habit of buying my palladium at Johnson's, and they then sold a pure precipitated palladium, prepared expressly for dentists. I should think that is the palladium which Mr. Rogers now gets, and has furnished to Mr. Tomes.

Mr. T. A. ROGERS.—On the only occasion that I went to Messrs. Johnson and Matthey's to buy palladium, I was asked if it was for "dentists' use," so I presume that is the same to which Mr. Harrison refers. I have now used it for twelve or fifteen years, and have found it to answer all the purposes of amalgam very well. One objection to it is that it is of a very dark colour, but, nevertheless, it does not seem to discolour the tooth. I have often been surprised to find, even when the wall of the cavity is very thin, how slight the discoloration is. The only other kind of amalgam I ever use is Ash's cement. We all know its advantages and disadvantages. Its colour is good, but, according to my experience, it certainly shrinks from the walls of the cavity in a short time. With regard to Mr. Tomes's paper, I think he has taken us rather out of our depth, and we are scarcely able to follow him. We were probably little prepared to find such imperfections in stoppings which, we were accustomed to imagine, filled every chink, cranny, and crevice of the cavity. He is, however, rather exacting in his requirements. I heard him, a few days since, very cross because an amalgam filling which he had put in ten years ago

was *beginning* to wear out. (Laughter.) I imagine that when we are obliged to use amalgams at all we do not expect them to last much longer than that. Then, again, even if we were to place a tooth in the vice in the workshop, and plug a cavity in it with gold, using the utmost possible pressure, and then examine such a plug under the microscope, we should find a state of things not exactly in accordance with our ideas of solidity. Practically speaking, amalgams answer our purpose in such cases as a good dentist would think it advisable to use them. Gold is far preferable; and the rule should be to use gold in all possible cases, but where we cannot make a good, effectual gold filling, to make a good amalgam stopping rather than an indifferent gold one.

Mr. HARRISON.—I quite agree, sir, with Mr. Tomes, that this is a subject which ought to be taken up by the profession, and I hope that, after the paper he has read to us this evening, the investigation of it will be taken up, and pursued by practising dentists in a more scientific way than has hitherto been done. Speaking practically, however, I think, with Mr. Rogers, that we have no reason to complain of the preservative qualities of certain amalgams which we have already in use. I have in my own practice seen many cases in which amalgam stoppings have lasted twenty years and upwards—and happen to have met with one case in which such a stopping lasted fifty-seven years, in the person of an old gentleman who carried the stopping to his tomb—and who gave me so peculiar a history of the practitioner who introduced it that there could be no doubt about its date. I saw this gentleman, for the last time, about two years before his death (the stopping having then been in the tooth fifty-seven years), and the tooth was at that time in a perfect state of preservation, and the stopping perfectly sound. I think, therefore, that, with frequent examples of such stoppings having lasted twenty and twenty-five years, and one of its having lasted fifty-seven years, we have no reason to complain of the preservative qualities of the amalgams we already have. What we mainly want, I think, is an amalgam which, while it will preserve the teeth as well as those we already have, will at the same time preserve its own colour, and the colour of the teeth, more perfectly than any we are yet acquainted with. This is a subject, the study of which I

think well worthy of our best attention. I will not venture to say, from the trials I have made of the known amalgams, which are the best; but I am inclined to think, of those I have tried in private, that an amalgam made of palladium, and one which I have occasionally used containing a very large proportion of gold indeed, are those which I have found last the longest, and preserve the colour of the teeth most perfectly. I am free to confess, however, that, for convenience, I am now in the habit of using the amalgams (as we most of us, I believe, do) which are prepared for us by parties not in practice as dentists—and who, taking a merely commercial view of the matter, naturally enough keep their preparations secret. I do this, however, not without reluctance, from the very fact that I do not know their composition—and I do hope, as I have already stated, that the profession will take this subject up, after what Mr. Tomes has said, and investigate it scientifically, giving to each other the results of their experience as to the materials, and their proportions, which are found to be best for carrying out two great objects. These I think, sir, are the great points which Mr. Tomes's paper endeavours to press upon us, and I trust they will not be pressed upon us in vain.

Mr. SERCOMBE.—In the course of Mr. Tomes's paper I observed that he spoke of washing his amalgam with ammonia. I should be glad to know whether he has tried washing it with chloride of zinc, or chloride of sodium, a plan recommended at one of the American conventions some time since.

Mr. TOMES.—I have not used either of the compounds which Mr. Sercombe has mentioned, but have confined myself to ammonia only. By the use of this a large quantity of dark matter has been separated from the amalgam, which has been rendered somewhat more plastic by the process. In respect to the remarks which have fallen from Mr. Rogers and Mr. Harrison, I may state that I fully concur in all they have said. The object of my paper, however, has not been to condemn the employment of amalgams, but to admit their usefulness, and at the same time to point out that their value would be rendered much greater if we had a more accurate knowledge of their qualities,—if we could obtain an amalgam which would enter into the minute fissures of the teeth, and there harden without undergoing any contraction—in point of fact, an amalgam which would really fill the cavity within which it is placed.

Mr. TRUMAN.—May I ask Mr. Tomes what amount of pressure was used in putting in the amalgams?

Mr. TOMES.—I used quite as much pressure as would be employed in operating upon a patient.

Mr. TRUMAN.—As much pressure as you conveniently could use?

Mr. TOMES.—I do not say that. Of course I might have put my whole weight upon the plugs, having the slides in my hand.

Mr. TRUMAN.—Did you find that the more pressure you used in the stopping the better the plug was?

Mr. TOMES.—I do not know.

Mr. TRUMAN.—Of the different plugs that you made of Mr. Ash's stoppings, that were some washed and some not, did I understand you to say that those washed with ammonia were best?

Mr. TOMES.—Yes, I have no doubt they were—a finer surface was produced.

Mr. TRUMAN.—The little experience that I have had in these matters would tend to show that the more pressure we can exert in filling the teeth with amalgam the better the plug will be. That is to say, that the amalgam, being prepared carefully, and as much mercury removed as we can, leaving the mass barely plastic, but rather hard than otherwise, and then using such force as we can, I think we find that the stopping lasts much better. I fear that in my early use of amalgams I fell into an error—that the amalgam was used much too soft—and that the quantity of mercury left in the plug was so large that the plug necessarily became porous. And I believe that lately, since I have removed as much mercury as I can, and before using the amalgam have forcibly pressed it in my fingers, so as to arrive at that point when it is just plastic, and capable of movement in the mass without granulating, and have then placed it into the cavity with care, portion by portion, first with a small blunt instrument, then with a burnisher rather larger, then with one with a round head as large as I could get easily into the cavity—so as to force the plug from the centre outwards—and then finished by keeping the top surface as close to the edges of the cavity as I could, I have found the stoppings last better. As far as my experience of Mr. Ash's stopping goes, it seems to me to answer remarkably well. I have seen some of the very earliest pluggings I have made with it, which are now solid and good.

Mr. CARTWRIGHT.—With respect to amalgam fillings, there is much difference as regards the character of the secretions acting upon them in different mouths, and teeth are liable to be influenced in various ways by decay. Fillings seem to shrink in some teeth, while in others they appear to swell out; but these conditions may rather be the result of further decay than increase of bulk in the filling. Therefore it may be that some little of success depends upon manipulation. I think if more care were taken in preparing the mass, so as to get it thoroughly incorporated with the quicksilver, it would last better. The object is to get rid of as much quicksilver as possible; care also is required as to the consistence of the material. You may squeeze out a certain quantity of mercury, then roll up the mass, and by manipulating in the palm of the hand you get it soft again, and if thoroughly washed previous to insertion it will make a much better filling than one hastily prepared and put into the cavity of a tooth in a mass. If we insert the filling in a mass the chances are that we do not get the same perfectly adapted filling as we do by introducing it in smaller quantities. It answers better to take a small portion of the filling, and press it very carefully against the walls of the cavity, and introduce other small pieces until the cavity is full, and a good stopping is made, and one which I have found will last, and I think with the chances of being pressed into all corners. I have observed that amalgam fillings of copper remain in the mouth for long periods. I have seen them perfectly good after eighteen or twenty years. I have seen teeth where the cavities have been very large—in fact, little remaining but enamel walls, stopped with that material and remaining intact. It is certainly not, as far as I have seen, the material itself which shrinks and which has given rise to objections; the change in colour is a fault, and, as Mr. Tomes says, the peculiar taste which it occasions in the mouth. The great object of the paper is to draw attention to the subject of these fillings, and to endeavour to arrive at as perfect a filling as we can. But I do not think the microscope a fair test for fillings. A very good one may be made which may not fill all the interstices with microscopic exactness; in fact, it is next to impossible to get a stopping made in the mouth which will resist the searching power of the microscope. It is the object of us all to

get as perfect a filling as possible, and that can only be effected by experiment. Therefore it is to be hoped that this paper will have the effect of inducing members to further Mr. Tomes's object, by making experiments from time to time, and bringing their results before the Society.

Mr. OWEN.—I think the very great difference in the quality of amalgams of copper and mercury depends upon the strength of the solution of copper from which the metal is precipitated. I procure the precipitate from a very weak solution, and I think we have in this way a much denser stopping, and one less likely to shrink than if the precipitate of copper were not in so fine a state. With respect to the application of amalgam stopping, I am persuaded a good deal depends upon the manner in which it is introduced into the tooth, and the completeness with which the excess of mercury is got rid of in that process. My practice is to introduce it in small portions to begin with, not too hard, packing it as a lining to the bottom and sides of the cavity. I then force into it a piece of amadou, which presses out the mercury over the sides of the tooth, and wipes it away nicely. I then use as a sponge a small portion of amalgam that has been very forcibly compressed, this absorbs any free mercury very effectively. I then apply fresh portions. In this way you may get ultimately the surface of the stopping, and, indeed, the stopping throughout, almost so hard as to bear mastication. I believe an amalgam stopping ought not to be dismissed in a state to be materially endangered by mastication within an hour or so.

Mr. TOMES.—I would ask Mr. Owen whether he is not speaking of the copper amalgam, because in using the other amalgams the process of operating is very different—for instance, with palladium amalgam.

Mr. OWEN.—I have spoken only of the copper amalgam.

Mr. T. A. ROGERS.—I have constantly tried this plan with regard to Ash's cement. After inserting and packing the first portion of cement, I have absorbed the superfluous mercury therein by adding pieces from which every possible particle of quicksilver had been squeezed.

Mr. TRUMAN.—May I ask Mr. Harrison to inform us what was the proportion of gold, and what were the other metals, and their proportions, which entered into the composition of the amalgam he spoke

of just now as "containing a very large proportion of gold indeed"?

Mr. HARRISON.—The proportion of gold in the amalgam to which I alluded just now will, I fear, be considered a very formidable one. It is a proportion of twenty out of twenty-four,—the filings containing twenty parts of pure gold, two parts of copper, and two of silver—being, in fact, made out of the gold plate I at one time ordinarily used. This, I fear, is an amalgam not likely to be adopted generally by the profession; but, as a reason for naming it, I could point, if it were right to do so, to the case of a gentleman known to most of you, whose central incisors I stopped with this amalgam in the year 1838, and which look as sound and as white now as if they had never been stopped at all. They were decayed on their posterior and approximal surfaces—and, although the stopping itself has become discoloured on its surface next the tongue, it has produced no discoloration of the teeth whatever, after this long interval.

When addressing you before, sir, I did not make any remarks as to the mode of introducing amalgams. I simply spoke of their value, and preservative qualities, in certain cases—the little I said being meant to support that which Mr. Tomes had been impressing upon the Society; but as a good deal has been said about the mode of introducing amalgams, and, in doing so, of the necessity of getting rid of all the mercury *possible*, I am induced to state to the Society what is my experience upon that point—as I differ on it from most of the gentlemen who have spoken on the subject. I must say that I think it is quite possible to squeeze an amalgam too dry before using it. My belief is that we get the best amalgam when we press out so much of the mercury only as to leave it perfectly plastic—so plastic—as that, while it crepitates, it will nevertheless not crumble under pressure. If it is made so dry as that, under the pressure of the finger and thumb, the surface cracks, I think we are introducing it too dry, and that these are the cases in which we get the more granular plugs. I believe this to arise from the fact that mercury, following the well-known laws of chemical affinity, unites with the metals with which we mix it in different atomic proportions, forming compounds differing in character—and I think that the most compact and the least granular stopping is got when we do not

squeeze out the mercury so very thoroughly as most of the gentlemen who have spoken seem to advocate. I am in the habit, therefore, of introducing it in the state which I have just described—and my mode of doing so is to use suitable instruments, pressing it in all directions into the cavity, very much in the manner in which I should introduce a gold plug—smoothing the surface and packing the edges very carefully. With reference to the comparative durability of teeth stopped with amalgams and with gold, I should say that we ought to bear in mind the fact that the teeth we stop with amalgams, are generally perishable teeth. When we have teeth of good structure, and with moderate-sized cavities, we generally stop with gold—whereas, we stop with amalgam those teeth only which are already very much decayed—where, perhaps, we cannot take out the whole of the decay, but are obliged to leave a portion of it behind, with probably the whole structure more or less imbued with disease. I think, then, that in estimating the preservative qualities of amalgam, we ought not to forget that the class of teeth in which we use it does not give it the same chance of success that gold has on the teeth in which we ordinarily employ it.

Mr. VASEY.—I think a very important point, in getting a solid plug, is the size of the instrument. We find, if we use instruments of very small diameter, we get a great deal of solidity. A very large instrument will not press the amalgam into all the interstices with the same power and effect, as a small instrument will. I find the same in gold stopping, and I am quite sure that experiments performed as Mr. Tomes explained, with a small instrument, would show a very marked improvement in the solidity of the plug.

Mr. TRUMAN.—Mr. Harrison, will you kindly tell me how that gold amalgam is made of which you spoke?

Mr. HARRISON.—Simply by rubbing the filings and the mercury together, thoroughly, in the palm of my hand, and then washing the amalgam well in pure water—which is my ordinary method when using any amalgam.

Mr. TRUMAN.—Expensive as such an amalgam would be, it is not so expensive a stopping as gold; and if what you state can be done with it as an amalgam, it would be an exceedingly valuable thing in my opinion.

The PRESIDENT.—I consider this ques-

tion one of great importance to the Society and the profession generally. Mr. Tomes says he has not tested all the stoppings sent to him. Under these circumstances I think we must rely on Mr. Tomes for further investigations. I am quite sure that to Mr. Tomes are due the thanks of this meeting for the trouble he has already taken, and I can only hope he will be persuaded to go on experimenting. I think the durability of amalgam stoppings doubtful, but I saw an old lady the other day who had a tooth that had been stopped with amalgam by Mr. John Clark, thirty years ago. I had occasion to remove the tooth, and she then told me how long it had been stopped. I took it into my workroom and examined it. It was a rough stopping, but in good condition. I found it to be nothing more than silver filings worked into an amalgam. I am not prepared to say that that kind of amalgam is best, but I mention this case as an instance of its durability.

Mr. MUMMEY.—I think, Mr. Chairman, that the durability of amalgam depends very much upon different conditions of the fluids of the mouth. Mr. Harrison's case of fifty-seven years' standing reminds me of one in which a silver amalgam had lasted sixty-six years. I found it in the mouth of a general officer, at the age of eighty-four, who told me the tooth had been stopped in his eighteenth year. I examined the plug, and found not the slightest defect around the margin. I had no opportunity of testing the condition of the walls of the cavity, but upon a careful external examination I found no symptom of its failure. The patient had enjoyed good health, and indeed the general condition of his teeth was excellent, with the exception of his having lost two or three of the molars.

Mr. COLEMAN.—I quite concur with the remarks that have just fallen from Mr. Mummery. I am in the habit of employing only one kind of amalgam, viz., that manufactured by the Messrs. Ash. I always use it in the same way, and it is very surprising to see the different appearances it presents in the mouths of different people. In the mouths of some persons it remains quite white and bright, in others its surface presents a light, and in others a dark-brown colour—which must, I think, depend very much upon the different conditions of the fluids of the mouth in different individuals; and it is very pro-

bable that these conditions may have a marked influence upon the durability of the stoppings. In perfecting amalgam fillings, much, I think, depends upon the method of packing employed. I am in the habit of employing a plan very similar to that described by Mr. Cartwright—viz., of introducing the cement in small portions, and pressing it into the irregularities of the cavity with a fine-pointed pressing instrument. When the tooth is nearly filled, I introduce a wedge-shaped instrument through the cement to the bottom of the cavity, and move it as a lever from side to side. On its removal I fill up the space it has left, and it appears to me that in this way I can always get more cement into the cavity than by any other, rendering the filling, of course, more compact. I think the method of filling an important question—because if by a better means of manipulation we can pack one kind of cement as well as another, it will be our chief object to select that which presents the whitest colour in the mouth.

Mr. DUFF.—I perfectly coincide with you, Mr. President, that any paper which Mr. Tomes takes in hand he will carry out efficiently. But perhaps he will pardon me if I make a suggestion. If he would use a larger cylinder for experimentalising with the amalgam, I think he would be better able to see the result. I think that these fissures—these little marks in Mr. Tomes's very ingeniously contrived apparatus—are so minute that they will not show whether the amalgam has never gone in or whether it has gone in, and they are owing to the shrinkage. I think if he went on a more enlarged scale it would tend to show more of the fluidity, so to speak, of the stopping, and whether it had permeated into those fissures, and had afterwards shrunk in the drying and so left the fissures again. I hope Mr. Tomes will pardon me for suggesting that idea; but if he got a tube of a size similar to that a good large molar tooth presents when there are only the walls remaining, perhaps the results might be a little more satisfactory.

Mr. TOMES.—Mr. Mummery has spoken as to the effects of the fluids of the mouth upon the durability of amalgams. I think we are entitled to ask from him some explanation on the subject. We know that amalgam stoppings, under certain circumstances, are durable; but we want to know precisely what those circumstances are. We want to know with

tolerable certainty what the results of our treatment will be. As regards the use of small instruments, recommended by Mr. Vasey, in making fillings, I may state that the instrument I used was a comparatively small one; but my object was to employ the amalgam much in the way that I, in common with many others, have used it, in order to obtain results similar to those which we ordinarily obtain in our practice. I think the observations which have been made this evening show that there are different methods employed in conducting the operation under discussion, and these methods, each and all, should be carefully tested, in order that we may obtain some more definite information both on the production and use of amalgams. I hope the subject will be taken up by various members of the Society, and examined from various points.

Mr. MUMMERY. — In reply to Mr. Tomes, I would say that I am, like others, feeling my way towards attaining a correct estimate as to the suitability of amalgam stopping, under different conditions of the mouth. We frequently find obvious indications of great acidity in the state of the fluids, and in this condition I should be very unwilling to use the metallic amalgam to any great extent—as I have generally found that under such circumstances oxidation goes on at the margin, and on removing an old amalgam stopping we often observe a layer of black oxide coating the entire cavity—a state of things I do not believe to occur so often in the absence of acidity of the mouth.

Mr. HARRISON. — I quite agree, sir, with Mr. Mummery, that an acid condition of the secretions of the mouth has much to do with the durability or non-durability of these stoppings—not so much, however, from its action on the stoppings themselves as on the teeth in which we ordinarily use them—and I think I may say that I have no difficulty in diagnosing the cases in which they are not likely to prove very durable. Patients come to us with teeth which are naturally soft—teeth in which the enamel is thin, and the dentine deficient in earthy matter—teeth prone to take on what is termed “white-decay”—teeth, in fact, in which the decay, treat it as you will, proceeds exceedingly rapidly. In such patients you will generally find the secretions of the mouth viscid, and the saliva acid. Now these are a class of cases in which we may be sure an amalgam stopping will not last long—nor, indeed,

would any other stopping last long. A gold stopping would not last long—and, generally speaking, such cases are not in a condition to receive gold stoppings. It may perhaps be asked, “Why stop such teeth at all?” My answer is, if a patient comes to me with one or two such teeth much decayed (the rest being sound), I should remove them; but if the patient comes with a mouth full of decayed teeth of this kind—where it is a question of *emptying* the mouth of teeth, or making the best of existing circumstances—I am of opinion that it is our duty to make them last as long as we can, even with amalgam stoppings, rather than empty the mouth, if this can be avoided—thinking it desirable, as a general rule, to avoid artificial teeth as long as possible—and being quite satisfied that there is no foundation for the fears entertained by some medical men, and by some members of our profession too, that amalgam stoppings exercise an injurious influence upon the general health. Mr. Tomes speaks of cases in which these stoppings perish in a few months. I cannot say that this at all accords with my experience. I think that if we take care to clear away as much of the decay as we can, to get good clean edges, at any rate, and to pack our amalgam stopping well, it will be found that, in almost the worst cases, three or four years will be the average time that such a stopping will last. Such, at any rate, is the result of my experience with regard to amalgam stoppings, even in the worst cases that I am in the habit of treating.

Mr. DUFF. — I may mention a case which came under my notice a short time ago, which exemplifies the necessity of medical men having a thorough reliance upon our modes of treatment. A gentleman in Shanghai had a tooth stopped by an American dentist. He became poorly in health, and so on. Symptoms of cancer exhibited themselves on the side of the mouth where the tooth had been stopped. A consultation was held by the medical men, and they thought the symptoms referable to the stopping. The gentleman said “Remove the tooth.” The tooth was removed, and he left Shanghai and came home, and brought the stopping to me. As far as I can judge, I think it is Ash’s cement. Unfortunately, however, the case proved to be a true cancer, and after having been twice operated upon by Mr. Fergusson, he died a lingering death last week. This case, I think, shows the necessity of

medical men having reliance upon our modes of treatment.

The **PRESIDENT**.—Our time, gentlemen, has expired. We must now leave this matter in the hands of our worthy friend for further testing. I am sure we all thank Mr. Tomes for the information we have received from him this evening. (Applause.)

Twenty-one cases containing specimens of mineral teeth, the production of upwards

of forty makers, from the year 1796 until 1861, were exhibited by Mr. Hepburn.

DENTAL APPOINTMENT.

CHESTER INFIRMARY.

We have much pleasure in stating that Mr. Frederick Bullin, D.L.R.C.S., has been unanimously elected dentist to this Institution.

The Month: Miscellaneous and Scientific Intelligence.

THE LATE PROFESSOR QUEKETT.

(From the 'Lancet,' Nov. 2nd, 1861.)

THIS lamented gentleman succeeded Professor Owen as Conservator of the Museum of the Royal College of Surgeons. This appointment he only obtained five years before his death; and since that period his health had been so bad that he was unable to insure his life. Before this time his income (£300) was too small to enable him to do so. Dying at the early age of forty-six, he was quite unable to make any provision for his family. He leaves a widow and four sons. An effort has been set on foot to raise a sum of money for the purpose of starting his boys in the world when their school education is completed. The following gentlemen have formed themselves into a committee for this purpose:—Prof. Owen, F.R.S.; the Hon. and Rev. Lord S. G. Osborne; Dr. Bence Jones, F.R.S.; Prof. Geo. Busk, F.R.S.; Frank Buckland, Esq. M.A., M.R.C.S.; Dr. Lionel Beale, F.R.S., Hon. Sec., King's College, London. Bankers. Messrs. Twining.

CONSERVANCY OF THE HUNTERIAN MUSEUM.

(From the 'Lancet,' Nov. 2nd, 1861.)

THE vacancy caused by the death of Professor Quekett in the Office of Hunterian Curator, will certainly not be filled up before the end of the year. The

Council have resolved to receive applications until a fixed day in November. The widest publicity will be afforded to the requirements and emoluments of the office, and thus a large range of candidature will probably be ensured. Since applications will be received so late, the appointment cannot be made in time to allow the curator to enter upon his duties before the commencement of next year; meantime the duties connected with the conservation of the museum are in the hands of the assistant-curators and resident pupils. The collections will certainly not suffer in their hands; and although the delay in making the final appointment will no doubt prove not altogether convenient or agreeable to those who have already announced themselves as candidates, yet the Council cannot be blamed for taking every step which may conduce to the ultimate appointment of the ablest and fittest man who can be found for the office. When it is remembered how largely Owen and Quekett have contributed to the reputation of the College, to the advancement of science, and to the English character in this field, by their employment of the materials constantly submitted to the curator of the College museum, it will be understood that the Council are very anxious to procure at this cheap rate a continued accession to their glory; and at the same time we must all be no less anxious to see the office filled by one well qualified to do justice to its duties.

THE ACTION OF CHLOROFORM IN THE BLOOD.

(From the 'Medical Times and Gazette,'
Nov. 2nd, 1861.)

IN the Boston 'Medical and Surgical Journal' for March, Dr. C. T. Jackson says, "Chloroform consists of one equivalent of formyle and three of oxygen. When chloroform is inhaled into the lungs the oxygen is abstracted from the blood and, combining with the formyle, makes formic acid, while chlorine combines with the blood as a substitute for oxygen. Thus a portion of the blood becomes chemically changed, disorganized, and rendered unfit for its vital functions." He further says, "I have now a phial of this blood (blood taken from a young lady killed by the inhalation of pure chloroform) before me, it having been kept in my office, exposed to temperatures from the freezing point to above 80° for more than six years, and yet it has not decomposed, nor has a single blood-globule settled to the bottom of the phial, nor has the colour changed in the least."

INNODULAR CALCIFICATION.

(From 'The Dental Cosmos,' September, 1861.)

IN the course of one of a series of very interesting articles on osseous tumours of the mouth, in the 'Med. and Surg. Reporter,' Dr. Jas. E. Garretson relates the following instructive case of this affection: "During the last session of the University, a student in the medical department applied to me, suffering from neuralgia so severe as to have entirely incapacitated him for study for a period of some three weeks. During this time he had tried all the ordinary remedies which had suggested themselves, without finding the slightest relief. The pain varied between the tuberosity of the superior maxillary and the ear. The teeth, about the tuberosity, were as sound and healthy looking as any I have ever seen; there was apparently, no local lesion, while, on the other hand, the physique of the gentleman was not at all of the neuralgic type. I was perfectly at sea with the case, until after a day or two there came to my mind an instance of innodular calcification of the dental pulp. I had once seen, at that time the only case, where the patient had

suffered in about a like manner. Now I did not judge, of course, that of a certainty I had differentially discovered the source of trouble, but still I felt so well satisfied, that I requested and obtained the consent of the patient to be allowed to drill into the pulp chamber of the wisdom tooth of the painful tuberosity. The result was the finding of the pulp filled with osseous granules—granules of osteo-dentine. The extraction of the tooth was followed by the immediate cessation of all pain, and the gentleman was able to go from my office direct to lectures."

DEATH UNDER CHLOROFORM.

AN inquest was held on Wednesday evening at the Infirmary, Newcastle; before Mr. J. T. Hayle, coroner, on the body of a man named John Cassnach, who had died on Wednesday, in that institution, while undergoing an operation. It appeared from the evidence that Cassnach was admitted into the infirmary on the 15th of August, under Mr. Annandale. He was in a weak condition, and labouring under scrofulous disease of the left knee-joint. Amputation of the limb was proposed as the only means of prolonging his life, and to that operation he consented. On Tuesday morning, being operation day, he was prepared, with others, for the operation; but being in a state of great trepidation, he was ordered brandy prior to being removed to the operation theatre. On being placed on the operation table, he was still labouring under considerable alarm. Mr. Bolton, the house-surgeon, in the presence of Sir John Fife, Mr. Annandale, and other gentlemen, administered chloroform, and the patient was soon under its influence, less chloroform than usual being required to produce the effect. A tourniquet was about to be applied to the limb, when a sudden change was observed in the patient. There was relaxation of the sphincters, a quiver of the lips, and he was dead. Galvanism and other measures were at once resorted to, but without avail. The heart had ceased to beat, and the breathing continued but a few seconds longer. Mr. Bolton made a post-mortem examination, and found the right side of the heart distended with fluid blood. Further than might be expected in a scrofulous subject, there was no evidence of disease in any of the internal organs; and Mr. Bolton attributed death to para-

lysis of the heart induced by fear, debility, and chloroform combined. The verdict was in accordance with the medical testimony.

INDIA-RUBBER VARNISH.

(From the 'Times,' Sept. 6th, 1861).

THAT india rubber dissolved in various liquids yields a good varnish is well known, but in general they are too viscid for delicate purposes, and are only good for making stuffs waterproof. India rubber, liquefied by heat, dissolved in oil of coal tar or drying linseed oil, does not give a varnish of sufficient fluency, or free from smell. Moreover, a considerable quantity of india rubber remains undissolved in a gelatinous state, suspended in the liquid, so that the solution is never clear. Dr. Bolley has recently published some remarks on this subject which may be useful. If india rubber be cut in small pieces, and digested in sulphuret of carbon, a jelly will be found; this must be treated with benzine, and thus a much greater proportion of caoutchouc will be dissolved than would be done by any other method. The liquid must be strained through a woollen cloth, and the sulphuret of carbon be drawn off by evaporation in a water-bath, after which the remaining liquid may be diluted at will with benzine, by which means a transparent but still yellowish liquid will be obtained. A more colourless solution may be prepared by digesting india rubber, cut into small pieces, for many days in benzine, and frequently shaking the bottle which contains it. The jelly thus formed will partly dissolve, yielding a liquid which is thicker than benzine, and may be obtained very clear by filtration and rest. The residue may be separated by straining, and will furnish an excellent waterproof composition. As for the liquid itself, it incorporates easily with all fixed or volatile oils. It dries very fast, and does not shine unless mixed with resinous varnishes. It is extremely flexible, may be spread in very thin layers, and remain unaltered under the influence of air and light. It may be employed to varnish geographical maps or prints, because it does not affect the whiteness of the paper, does not reflect light disagreeably, as resinous varnishes do, and is not subject to crack or come off in scales. It may be used to fix black chalk or pencil

drawings; and unsized paper, when covered with this varnish, may be written on with ink.

In the report of a case of successful operation of staphyloraphy with silver sutures, by Professor A. Dugas, in the 'Southern Med. and Surg. Journ.' for August, Dr. De Saussure Ford mentions that this "infirmity may exist under three divisions—first, where simply the uvula is divided; second, by division of uvula and soft palate; third, division of uvula, velum, palatine bone, and often palatine process of maxillary bone, often laying the floor of the nasal cavity entirely open; in either of these cases the patients are peculiarly prone to affections of the throat, such as catarrh and inflammations about those parts."

A FRENCH military surgeon, M. Martenot, has recently proposed as a local anæsthetic agent, for rendering the skin and superficial tissues insensible to pain during operations, a preparation composed of camphor dissolved in chloroform (two fifths by weight of camphor to three fifths of chloroform). Such a solution applied by means of charpie for the space of twenty minutes to a part about to be operated on, will, he maintains, produce perfect anæsthesia.—*From 'The Lancet,' August 17th, 1861.*

To Correspondents.

NOTICE.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.
2. All communications relative to subscriptions and advertisements are to be addressed to the Publisher, Mr. John Churchill, 11, New Burlington Street, London, W.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call parti-

cular attention to the importance of a carefully-penned signature and address.

5. The Journal will be supplied direct from the Office on PREPAYMENT of subscriptions as under:

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"Mr. Mummery."—The proof was sent too late, but you will find the corrections were already made.

Communications have been received from Dr. J. L. Levison; Messrs. Geo. Owen; S. C. Gibbons; Alfred Hill; Crapper and Brierley; An Old Dentist; Excelsior; C. A. Fox; J. P. Collis; and W. Duncan.

Advertisements.

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British Journal of Dental Science.

No. 66.

LONDON, DECEMBER, 1861.

VOL. IV.

Dental Surgery and Medicine.

JOHN HUNTER'S PLAN OF TRANS-PLANTING TEETH; HOW APPLIED IN A CASE OF INGRAFTING NEW CROWNS.

BY DR. J. L. LEVISON.

MOST practitioners are aware that the justly-celebrated physiologist John Hunter recommended, when any of the crowns of the incisores or cuspidati were decayed, to supply their loss by what he termed "transplanting" a sound tooth for the defective one.

The plan consisted in extracting the carious incisor or cuspidatus, and to obtain their substitutes by purchasing from needy persons their good teeth for a monetary recompence.

The defective tooth or teeth being removed, the new ones, still warm, were inserted in the mouth of the patient, and they were said to become firmly fixed. Whether it actually answered in some cases as affirmed, and not in others, may or may not be true. But as there are not two fangs exactly the same in shape, length, and thickness, it might be inferred that in the majority of instances, the substituted tooth or teeth purchased of a stranger could not become firmly fixed in the alveolus or alveoli of the individuals for whom they were thus procured. The plan was, however, soon repudiated, as in many instances the new possessor became infected with diseases when any existed in the persons from whom they had been extracted.

I have alluded to the transplanting process from a circumstance which occurred some years since in my own practice.

A young lady applied to have the crowns of two central incisores engrafted to

her stumps, and this was only a day or two before her marriage.

She was rather stout and muscular, and in excellent health, but with short thick teeth, which were at the same time very tough*.

Nevertheless, as there did not seem any cause or impediment for the operation, as she had not suffered the slightest pain from the carious crowns, I took a pair of Fay's cutting forceps, with the intention of excising them. But as they were so strong and tough some effort was required; and to my great horror, instead of the crown being separated, the whole tooth came out.

In a dilemma, what was best to be done, I tried the other incisor, intending to use a small plate for the one which had been absolutely removed from its place, and to use the remaining stump for a pivot to hold both in *situ*, and again took the cutting forceps, and applying the force very cautiously, yet this also came away altogether, increasing my annoyance and chagrin.

It was some relief to me when remembering John Hunter's mode of transplanting teeth. For I concluded that if this system ever answered, that the one then mentally proposed to be used under existing circumstances would in all probability succeed.

Without rinsing the mouth, so as to remove the blood from the alveoli of the extracted teeth, the fangs were sawn off, and new crowns fitted to them, and pivoted more firmly than if the fangs had remained. The two teeth thus prepared were then placed in rather hot water at 160° of Fahrenheit's thermometer, and after a brief time were inserted in their respective sockets, whilst the warm blood was in them, and

* The front teeth had decayed from lateral pressure.

they were gradually forced into their exact places, and so fixed that the edges of the new crowns were covered by the gums; and in a very short time the temporary pain, which the rapidity of the operation occasioned the patient, altogether ceased. When this was the case, the gums were incised on each side of the new teeth longitudinally, with the object of ensuring greater security when these wounds should cicatrize. At the same time the fact was explained to my patient, and that I had had recourse to the plan from the pressing necessity, and added, that if, after her marriage, she should experience any inconvenience, by the new teeth not feeling perfectly secure, that they should be taken out, and after a week or two, they should be replaced on a gold plate without any additional fees.

The lady was delighted. And as she looked at herself in the glass, she exclaimed, "I am so glad they are in; what should I have done if they had not been, I should have been such a figure!"

She was, indeed, a pretty young woman, and might therefore be excused for this open confession of a little laudable vanity.

The accident and the experiment were soon forgotten in the various occupations which at the time engaged my attention. But about two years after the occurrence, a lady applied to have two teeth stopped, and asked in a peculiar emphatic manner, whether I remembered her? Not wishing to offend any one, I remarked that her face was very familiar to me, but that I had forgotten her name. She then said, "Do you not recollect inserting two front teeth for a young lady, a few days before her marriage, when the whole teeth came out, at the time the attempt was made to cut off the crowns?"

I did indeed then recollect the circumstance, and asked "If the teeth answered?" Her reply was very satisfactory.—"That from the time they were inserted, they had remained perfectly secure, and had never given her the slightest inconvenience!"

Though the case now mentioned had been suggested by an accident, I have from that period often had recourse to the

same practice when there has existed much pain in the teeth to be ingrafted with new crowns. In such instances having invariably extracted the teeth, sawn off the defective crowns, and secured new ones to the stumps, and reinserted them in their respective sockets, always taking care when the gums were spongy and vascular to leech them, and at the same time I recommended the use of astringents.

I have also adopted the same practice in persons of highly nervous temperament, in which the very preparation of the fang or fangs for inserting pivoted crowns, tended to cause more or less local suffering, or great mental disturbance.

And, although objecting to John Hunter's plan of transplanting teeth for the reason previously mentioned, even if there did not exist any danger of infection, from the fact that it is evident that the strange fang can never exactly fit the socket of another person, and then there is a probability of much local irritation, as the newly-inserted tooth is likely to act as a foreign body, and still to increase the inflammatory action. Such is not the case when the original fang is used as described above.

In conclusion, I may remark, that even when the practice now recommended is not adopted, that it must be wrong to persist in engrafting new crowns to the remaining fangs, when during the preparation for the same much pain is experienced. I invariably desisted under such circumstances, not only from the probability of continued suffering and injury to the health, as consequences of the local pain, but from the experience of many years, that if a crown is inserted when the fang is inflamed, so that much suffering is experienced that it had invariably to be extracted in a majority of instances, as a choice of two evils.

There may not be any novelty in the plan I have detailed, but I am not aware that it had ever been in use, confessing, as I candidly do, that it was first suggested to myself by the accident described, and that it proved by another example, that "necessity is the mother of invention."

Mechanical Dentistry.

DENTAL PATENTS.

By GEORGE OWEN.

(Continued from page 287.)

1855. Henri Schoofs.—For improvements in making, fixing, or attaching artificial teeth, gums, and palates.

The specification in this case refers to the construction of artificial teeth, whether for the upper or the lower jaw, with bases of "*gutta percha or caoutchouc, either mixed together or separate, or modified by the mixture of other gums,*" and electro-gilding the same, or covering them with leaf gold. In every essential feature this invention is identical with that of Mr. Truman, previously patented 1848 (see p. 237).

Another part of the specification relates to covering spiral springs with gutta percha or india rubber. In this expedient the patentee had been anticipated also, Mr. Gilbert having applied for letters patent for the same in March, 1854 (see p. 270).

Lapsed April 21st, 1858, at the end of three years.

1855. Eugene Gillet.—For improvements in fixing artificial teeth.

PROVISIONAL SPECIFICATION.

"According to my invention, I fix the front single teeth by soldering a pin on to the base plate; this pin slides into a groove in the back of the tooth. The groove and pin are dovetailed; the tooth is slidden on to the pin, and then fixed by a fine screw, which enters at the back of the pin into the tooth. To fix the back teeth, I make an oval hole in the base of the tooth, which enters about three quarters up the tooth, and at the top of the oval hole is a circular recess. Two small hooks are soldered on to the base plate; these hooks, which are forced apart by a pin which passes between them, enter the oval hole in the tooth, and the tooth is fixed by being turned a quarter round, the ends of the hooks entering the circular groove at the end of the oval hole."

Void by reason of the patentee having neglected to file a specification in pursuance of the conditions of the letters patent.

1855. John Coghlan.—For an improved method of pivoting artificial teeth.

PROVISIONAL SPECIFICATION.

"My invention of an improved method of pivot-

ing artificial teeth consists in the use of a capillary tube in lieu of the solid wire now used for that purpose. The advantage gained by my invention is, that the column of air necessarily contained in the canal of the prepared stump of the tooth has an easy means of escape, and is not injected into the living tissues, as is so often the case in fixing the solid pivot. With this capillary tube a tooth may be at once pivoted tightly without any disturbance of the living parts, and consequently with an enormously diminished risk of alveolar abscess.

"This method applies to the pivoting of all artificial teeth, and is perfectly new, and in the case of old secreting stumps of teeth it affords a ready mode of giving exit to the secretion. The capillary tube may be so small as not appreciably to diminish the strength of the wire, or interfere with bending it in adapting the tooth to its proper position."

Lapsed at end of provisional protection, notice to proceed not having been given.

1855. Jean Pierre Garbai.—For an improved powder or composition for cleaning and preserving the teeth.

The recipe for this *invaluable* compound is as follows:

250 parts	Sea salt.
13 "	Iron in solution.
150 "	Coffee with or without chicory.
250 "	Sugar.
2000 "	Rice flour.
6 "	Saffron in liquid state.
15 "	Rhubarb.

It is used either with a brush, or *inserted into the cavity of a diseased tooth* in any suitable manner. When for daily use, ten parts of cream of tartar and 5000 parts of ivory powder may be added. Lapsed September 14th, 1858, at the end of three years.

1855. John Hall Brock Thwaites.—For improvements in the preservation of teeth, and in the manufacture and application of artificial teeth.

PROVISIONAL SPECIFICATION.

"These improvements consist in the employment of the metal aluminium, for the purpose of stopping decayed teeth, and in the manufacture of artificial teeth or blocks, with the plates, pins, rivets, springs, or other attachments for the same, either wholly or in part aluminium."

This invention did not proceed to the great seal, and lapsed accordingly.

1855. Alfred Abel.—For improvements in stopping, filling, or plugging teeth, and instruments to be used therefor.

PROVISIONAL SPECIFICATION.

"My invention of improvements in stopping, filling, or plugging teeth, and in instruments to be used therefor, consists, 1st, of the use of a metallic plug or cap, by preference, of platinum, made concave on the under side, so as to cover and protect the nerve in a carious tooth. And, 2ndly, my invention consists of the use of concave or hollow drills, by means of which teeth may be drilled or scraped without touching the nerve."

Lapsed at end of provisional protection, notice to proceed not having been given.

1855. Edwin Thomas Truman.—For improvements in palates or holders for artificial teeth.

ENTIRE SPECIFICATION.

"My invention consists in the employment of aluminum, or, as it is sometimes called, aluminigium, either alone or combined with gutta percha, or with another metal, or with both gutta percha and another metal, for artificial palates or holders for holding artificial teeth.

"By the employment of aluminum combined with gutta percha for the palates or holders of artificial teeth, I secure with great lightness (aluminum being about one tenth of the weight of gold) sufficient rigidity in the body of the palate or holder to prevent it getting out of shape while the gutta percha surrounding it and coming in immediate contact with the gums, and extending over the base of the teeth, is sufficiently yielding to afford every comfort to the wearer.

"The manner in which I carry my invention into effect is as follows:—I take a stout wire, or a rod, or a bar of aluminum, either round, square, or of any other desired form, and bend it to the shape required in such a manner that the teeth when placed upon the bar and imbedded in the gutta percha, shall occupy those places in the jaw intended to be filled by artificial teeth.

"I prepare artificial teeth for securing to the aluminum holder, by fixing in the back of each artificial tooth a loop or eye, in such manner that the loop shall be in the same parallel line with the length of the tooth; or I fix the loop or eye at the base of the tooth, a method which I follow particularly for back teeth. I form the loop of platinum wire, and cause it to adhere by inserting the ends thereof in the case of mineral teeth into the mineral while in a soft state, and then bake them in a furnace; or any other suitable metal may be used for the loop, and may be connected to the tooth by other means. The loop is formed to correspond to the shape of the aluminum holder.

"Now, in order to finish the palates or holders and fix the teeth thereon, I thread on to the aluminum holder as many artificial teeth (prepared with loops as aforesaid) as are necessary, cover the bases of the teeth, and surround the holder with suitably prepared gutta percha applied in a heated, soft, and plastic state, in order to cause it to fill up the spaces, and assume the form desired. I finish the

whole by shaping the gutta percha over a cast of the gums, for which the artificial teeth are required, and allow the gutta percha to cool, when the holder and teeth are ready to be fitted in the mouth; or, having selected the teeth necessary to fill the spaces with the loops in the most convenient position, I fasten them on a plaster model in their proper form with wax or other suitable material, and then by means of a metal cast taken from the plaster model so prepared, I form a plate of aluminum, which I cause to pass over the back of the teeth in such manner as to enable me, by means of the loop or loops on the teeth and corresponding loop or loop holes in the plate, to pin, bolt, or tie the teeth to it in their proper position, and I then make good all the hollows and interstices necessary with gutta percha, the whole combined having the requisite shape and size for use.

"I am aware that mineral teeth have been prepared with loops, fixed in a direction across them for the purpose of being affixed by means of a pin or metal back to a gold or silver plate, and therefore I lay no claim to forming teeth with such transverse loops; but I claim,—

"First, the making of the palate plates or holders for artificial teeth of aluminum, as hereinbefore described, the fitting of artificial teeth with loops or eyes in the particular manner hereinbefore described, and the fixing of the whole together by gutta percha alone, or by pins or wires and gutta percha, as also hereinbefore described.

"And, second, I claim the combined employment in the manufacture of palates or holders for artificial teeth of aluminum and gutta percha, together with platinum or other suitable metal loops, eyes, or wires."

Lapsed November 1st, 1858, at the end of three years.

1855. Louis Eskell.—For a new enamel for stopping decayed teeth.

PROVISIONAL SPECIFICATION.

"This invention consists in combining together into a mixture or enamel certain ingredients, matters, or substances, both vegetable and mineral (not heretofore employed in combination), for filling or stopping decayed teeth. The following are the ingredients, matters, or substances which I employ in the manufacture of the aforesaid enamel, namely, stearic acid (commonly known as stearine), New Zealand gum, pure sulphate of lime, blood shellac, and carradan balsam. The stearine is first dissolved, and then the New Zealand gum is mixed with the above, after which the sulphate of lime is added and a small quantity of blood shellac, and finally the carradan balsam; the whole of the above ingredients are thoroughly mixed and incorporated together, and when solidified are fit for use, and constitute the above enamel, which by the application of a gentle heat may be easily moulded or wrought by hand into the desired form, and from its unchangeable colour and hardness render it well adapted for filling or stopping decayed teeth."

Lapsed at end of provisional protection, notice to proceed not having been duly given.

1855. Frederick Abraham Eskill.—For an improvement in plates for attaching artificial teeth.

PROVISIONAL SPECIFICATION.

"My improvement relates to the plates or pieces to which artificial teeth are affixed by rivets or other usual means for the purpose of attaching them to the gums.

"My improvement consists in coating or covering such plates with *enamel*, which will entirely prevent any corrosion or uncleanness to which such plates are subject when placed in the mouth."

Lapsed at end of provisional protection, notice to proceed not having been duly given.

1856. Edwin Thomas Truman.—For improvements in artificial palates and teeth.

ENTIRE SPECIFICATION.

"My invention consists in imbedding or combining wire gauze of any suitable metal in or with any mineral substance or substances, which is or are now or may be employed in the manufacture of artificial palates and teeth. Or, instead of wire gauze, metal plate perforated so as to form network may be employed, though not so advantageously. The object of my invention is to afford as extended a medium of attachment as may be to resinous substances, such as gutta percha, or to metals. I employ the means at present adopted for manufacturing the teeth or palates, but instead of using pins, slotted plates, or loops to attach the teeth or palates to other substances, I employ wire gauze or metallic network for that purpose. I insert the wire gauze into the tooth or teeth or into the palate in the manner and position best adapted for affording the most extended medium of attachment to the gutta percha, resinous, or metallic substances with reference to the situation which the tooth or palate is intended to occupy in the mouth.

"I carry my invention into effect by preasing suitable parts of the wire gauze into the substance of which the tooth or palate is formed previous to its being baked or fired. Thus, in the case of palates, I place thereon a piece of wire gauze with the edges frayed out, and forming points projecting downwards into the mineral. The body of the wire gauze remains upon or just above the upper part of the mineral substance. After baking, the wire gauze or network upon the top of the mineral presents a surface upon which gutta percha or other like suitable material may be held or fixed, and this can be moulded to the gums, and be made to form an easy and comfortable appliance. In the case of

teeth, the points or frayed edges of the wire gauze are imbedded in the tooth or teeth, and the body of the gauze remains outside on the inner side or base of the tooth, and affords an extended medium of attachment.

"And having now described the nature of my said invention, and the manner in which the same is to be performed, I declare that I claim the imbedding or combining of wire gauze or metallic network in any suitable mineral substance employed in the manufacture of artificial palates and teeth.

Still in force, but *may* lapse January 8th, 1863, at the end of its seventh year.

(*To be continued.*)

To the Editor of the 'British Journal of Dental Science.'

SIR,—Will you allow me to suggest, through your journal, the use of borax, for hardening plaster models, instead of the usual method with wax and resin, stearine. &c.

In the vessel used for dipping, place as much borax as will half fill it, and add water until two thirds of the contents are occupied.

When it is wished to harden any models, place the liquid on the fire and boil. It will be found that all the borax dissolves. Dip the models and let them remain in the solution for ten seconds, more or less, more if very wet, less if quite dry.

I think there will be found certain advantages in this over the old plan. It renders the plaster much harder, can be done immediately on removing the wax impression, comes out of the dipping composition perfectly clean, which obliterates the trouble of "melting off," so often required in the use of wax and resin, and there is no danger of boiling over, should a model inadvertently slip in.

I believe borax has been used in other arts for hardening plaster, but amongst dentists I think it is not generally known.

Yours truly,

F. H. BALKWILL.

British Journal of Dental Science.

LONDON, DECEMBER, 1861.

PERIODICAL events afford opportunity for reflection. The coming event appears distant *longo intervallo*, and the annual duty of to-day is completed with a long-drawn breath of satisfaction which speaks as forcibly as if the words were uttered, "It is a year before I shall do this again." But oh! the speed with which the distance, seemingly so long, contracts, merges, and is again prolonged into another future! It is as though Time himself were bitten with the universal go-a-headism; and the longer we live, the more rapid does he appear to hurry us past days, months, quarters, and years, as, in a measure, his gaunt prototype, in express railway life, whirls us with screaming, rushing haste past milestones, bridges, and stations.

In these much to do and little time to do it all in days, we individually have scarcely time to look back upon the events of the past year; new matters crowd in with new times, and we seem to be hurried on past reflection. It is as much as we can do to keep our course; like ferry-boats in rapids, which require such skilful guidance, so we, in life's rapid course, require to be ever watchful and accomplished craftsmen.

With regard to the conduct of journals, whether daily or monthly, the same hurried pressure applies; we had no sooner sent our last sheet to the printers, and taken a complacent stretch, nay, even entertained thoughts of going out to amuse ourselves, than the work of the forthcoming number begins; and before we had finished congratulating ourselves on the completion of our work, the next month's instalment is staring us in the face. Oh, poor wretch

of an editor! whom no one pities and every one abuses—why look for peace, why hope for comfort? Beds of roses are not compatible with editorial aspirations; couches of thorns and hedgehogs are fit resting-places for thee!

Many years ago a great creator of pantomimes—a genius in his way—and genius may be exhibited even in merry-making, complained that work as he would, few he found to second his efforts, and he retired from the pantomimic world in disgust. Cattle require proper food or they fail in goodness and quality. The loom with its wonderful complications would not fulfil its task, were the power that sets the thing in motion not properly supplied with fuel and water. So a journal requires to be regularly supplied with nutriment in the form of contributions, upon which only it can thrive, and which is the aliment, indeed, which the nature of its formation, and the character of its circulation suggests. We crave, then, at the heads and hands of our professional brethren, who are interested in the health of the Dental Journal, the food which will support it. We are not ashamed to eat of the crumbs which fall from the rich man's table.

At the close of the year, and in the last number for the year 1861, we may glance back and survey our comings and shortcomings, and reflect on the state and prospects of our profession. On the whole, we trust that our Journal has been considered by our readers to have held its character as a scientific and useful periodical. We have steadily upheld what we consider to be true and legitimate principles as regards professional policy, and we shall continue

without flinching to expose what we consider to be erroneous views; and we again warn our readers against doctrines which we firmly believe, would, if allowed to take root, do grievous and irremediable injury to our profession. We have warmly supported measures which, free from individual exaltation and personal interest, tend to the general good, and which were planned and carried out for the general weal; and we have placed at their true value such as are framed and paraded in a spirit of extensive and offensive puffism.

The papers during the year read at the meetings of the Odontological Society, and which, together with the discussions thereon, have been reported in this Journal, have been satisfactory, some evincing much painstaking and scientific research. Sameness of subject has been perhaps a too prominent feature. We are glad to know that the society is in a flourishing condition, and we look to its influence as effecting much good in the profession.

The Dental Hospital of London, in Soho Square, and the London School of Dental Surgery are likewise powerful institutions to effect good. The former is largely increasing its sphere of usefulness. We hear that something like 7000 patients have been attended to this year, a very large number considering the hospital has been open only three years. It is a boon, indeed, to the poorer classes to be able to procure gratuitously such assistance. Valuable, too, must such practice be to those pupils who are fortunate enough to have the advantage of attending it. Pupils of former days and many practitioners too, would have given much to have had such opportunities of acquiring a preliminary knowledge of their professional duties. Whilst on this subject we would suggest whether it would not be conducive to the interests of the hospital and interesting to our readers if weekly returns of the number of patients, and the operations performed, were sent for insertion in the pages of the journal. The London School of Dental Surgery progresses well,

and will progress. We feel confident that in a few years, the examination in Dentistry at the College of Surgeons will be sought by every aspirant to Dental practice.

If paper puffs and most unwarrantable assertions can form a substantial institution, a new hospital called the National will be a great success; but, whether it succeed or no, some unenviable notoriety has been achieved, and a very selfish purpose no doubt answered. Whether the profession of dental surgery is likely to be elevated by the style of "singular" proceedings recorded in the 'Daily Advertiser' and some penny papers, is a question which will not require the waste of time or trouble to determine. The mere fact of the establishment of a new hospital would be with us rather a matter of congratulation than otherwise; but the animus which has led to its formation, and the principles which its inauguration is intended to foster, are so fraught with mischief, and so antagonistic to the dignity, standing, and respectability of the profession, that we feel called upon to urge the lukewarm to reflection. This we can assure them is no time to look on and do nothing; momentous interests are at stake, and it behoves every dentist to make up his mind, and act at once, or sound principles may be choked by rank and vulgar weeds; as you value professional status, bear in mind that the question is, whether we shall constitute ourselves a profession of educated gentlemen, or allow principles tinged with bad feeling, and supported by mis-statements, and low in tone, to exercise dominion over us.

We thank those gentlemen who have supplied us with original practical and scientific papers. It will be our endeavour to increase as much as possible the scientific character of the journal, and we are happy to say that several papers have been promised for the ensuing year. We shall begin the new year with a determination to uphold the principles we have already supported—to watch jealously over our professional interests, and to make the

pages of our journal as useful and instructive to our readers as possible.

In all probability the new year will be a stirring one. The International Exhibition will attract crowds to London, and visitors will be anxious to see other sights besides the sight *par excellence*. No doubt in various ways instruments and appliances used in the surgical and mechanical departments of dentistry will be largely represented. We shall be called upon to show attention and hospitality to professional brethren practising in the country, or abroad; and the Dental Hospital and School, together with the Odontological Society, will be to them objects of interest.

The anticipated rejoicings will be marred in a great measure should "Grim visaged war" not "smooth his ruffled front." But we shall all cheerfully put up with inconvenience and disappointments should a kindred people, after having insultingly in-

fringed our rights, so far forget themselves as vulgarly to support the offensive act, ungenerously to refuse to make atonement, and, above all, recklessly to brave the measure of England's just indignation.

As we are writing, we hear, with the deepest regret, of the death of his Royal Highness the Prince Consort. Such sudden and saddening news throws into shade the warlike topic of the day. The event has filled every heart with sorrow, and we all feel that a grievous blow has fallen on our beloved Queen. May God in his mercy give her strength to bear it!

Science, art, and literature have lost a staunch friend; England, a Prince whose exemplary conduct in public and private has won for him universal respect and regard; our Queen, a kind and devoted husband; and the royal children a most tender father and anxious friend.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by our Correspondents.]

OXY-CHLORIDE OF ZINC FOR FILLING TEETH.

To the Editor of the 'British Journal of Dental Science.'

DEAR SIR,—In case the subjoined formula for this filling, published in the 'Cosmos,' may have escaped your notice, I beg to call your attention to it, in the belief that it is a subject which must interest many gentlemen in the profession.

I remain,

Your obedient servant,

G. W. RUTTERFORD.

Dental Dépôt,
11, Poland Street.

Triturate thoroughly in a mortar, refined borax, 1 part by weight; quartz, 2 parts; and then add gradually 45 parts pure French zinc white; when perfectly incorporated, calcine in a hessian crucible at a good red heat eight or ten minutes.

This forms a frit which, when cool, must

be ground very fine in small quantities at once, together with trifling portions of colouring matter, such as yellow ochre and burnt amber, to impart the desired shade. To 1 part of the pulverized frit add 3 parts by weight of calcined zinc, and combine thoroughly in a mortar. The powder is now ready for use, and should be bottled and stopped tight. That which is recently made sets quicker, and becomes harder than the old; consequently, it is better to calcine but a small quantity at once.

The solution is made by dissolving one ounce of the dry salt chloride of zinc into six drachms of water. If made weaker, the paste requires a longer time to set, and is not so hard; if stronger, it attracts moisture from the air on exposure, proving that a part of the chloride remains uncombined.

Sometimes borax has been dissolved in the solution, but without improving it.

[We are much obliged for this reminder.—Ed. 'B. J. D. S.']

Dental News and Critical Reports.

THE ODONTOLOGICAL SOCIETY.

MONDAY EVENING—*Dec. 2nd, 1861.*

W. M. BIGG, Esq., President, in the chair.

The minutes of the last meeting having been read and confirmed,

The following gentlemen were balloted for, and announced as being elected members:—Honorary—Professor Owen, F.R.S. Resident—Mr. F. H. Balkwill, L.D.S.R.C.S., Canonbury, Islington; Mr. E. H. Tweed, L.D.S.R.C.S., 11, Brook Street, Grosvenor Square. Non-resident, —Mr. W. Hunt, L.D.S.R.C.S., Yeovil, Somersetshire; Mr. W. Pearce, 8, Trinity Road, New Town, Bristol. The announcement of Professor Owen's election was received with loud applause.

The names of the following gentlemen were then announced as candidates for election as members of the Society:—Resident—Mr. S. C. Gibbons, 70, Berners Street, Oxford Street; Mr. J. J. H. West, 69, Old Broad Street. Non-Resident—Mr. J. J. B. Bate, Brighton; Mr. W. Campbell, L.D.S.R.C.S., Dundee; Mr. O. A. Fox, L.D.S.R.C.S., Pavilion Parade, Brighton; Mr. Moore, Plymouth.

Mr. FLETCHER.—Mr. Broadway wishes me to bring before the Society two pieces of vulcanite, in which he has introduced a layer of partially baked rubber, in order to afford a soft medium to the gums, which he thinks may in some cases be found useful. The result as to its wear, I believe, has not been as yet ascertained.

Mr. BENNETT.—Sir, will you allow me to ask by what process the softened condition of this rubber was produced? I may observe that I applied hard and soft rubber together in a case of cleft palate, about twelve months ago—a duplicate of which I had the pleasure of showing to Mr. Ibbetson. The rubber I used was the red substance known as Ash's g. rubber. I should like to know if this specimen has been softened by any new process.

Mr. BROADWAY.—I shall be very happy to give you any information I can. I do

not claim anything new in that process. I did it at the request of two or three gentlemen in the room as an experiment. Mr. Fletcher was kind enough to say he would introduce it to the Odontological Society. I have no claim to its being original beyond this, but if it does answer the purpose we have in view, it will be a great boon to the patients. Whether it will stand the wear and tear, sets of teeth are called upon to stand, has to be proved, but I think it is worth the trial.

Mr. OWEN.—I think very great care ought to be exercised in the introduction of any semi-hardened rubber into the mouth, inasmuch as in that state it may be very pernicious. With regard to the ordinary vulcanite, the condition is so changed, and it is so totally unacted upon by the fluids of the mouth, as to be perfectly harmless, so far as perfect hardening can render it so; but in this state it may, for anything we know, be very detrimental. I should like to know whether Mr. Broadway knows anything about the composition of this india-rubber.

Mr. BROADWAY.—No, sir, I do not.

Mr. OWEN.—It is well known that some specimens have contained yellow sulphuret of arsenic, and I should seriously object to use any in the condition of this specimen, unless I knew its composition.

Mr. WALKER.—I did not intend to make any observations this evening, but as Mr. Fletcher has introduced several specimens of artificial sets of teeth, with some semi-vulcanised rubber attached to the gum surface of the vulcanite base, I think it will not be out of place, when I remember this layer of soft rubber will be in close apposition with the gum, to record the history of two cases which have occurred in my own practice, with the peculiar symptoms attending each case, and which I attribute to the patient wearing artificial teeth mounted in vulcanised rubber. I do so hoping that other members of this Society will give us the advantage of their experience in any similar cases.

About twelve months since I placed a mineral central incisor mounted on vulcanite in the mouth of a lady, the

case fitted well, and was placed in the mouth without inconvenience to the patient. In seven or eight days the patient returned to me and complained of great dryness of the mouth, on inquiry she stated that, prior to the sense of dryness she then felt, there had been a considerable increase of saliva for some time, the frænum lingua was slightly pressed upon by the frame of vulcanite which I freely relieved. She wore the piece another week at the end of which time I saw her again. The symptoms then were a sense of general dryness of the mouth and throat with increased heat. On examination, I found some small pustules in the inside of the lower lip, and on the tip of the tongue; the tongue itself was swollen, and the lower lip much swollen. I desired her to discontinue wearing the piece for a few days, and see me again. At her next visit, all the unpleasant symptoms had subsided, and the mouth restored to a healthy condition, I replaced the piece, but after keeping it in the mouth several days, the same symptoms again appeared, I again removed it, and prescribed a mild aperient, and tonic mixture, as the patient was a little low in tone, also a mouthwash. At the end of a fortnight, she once more placed the teeth in the mouth, but with no better success. Feeling convinced that the return of the symptoms was due to the vulcanite, I mounted the tooth on a small gold plate which she wore with great comfort.

The other case is that of a patient wearing a large upper case, supported by a molar tooth, one on each side of mineral teeth mounted in vulcanised rubber, this patient complained of dryness of the throat and soft palate as the first symptom, then swelling of the tongue which had several small pustules on each side, the patient stated that the mouth appeared quite drawn, the symptoms continued, and increased, until she discontinued to wear the case when they gradually subsided.

Since observing these cases, I have referred to one or two works, and find that one of the most frequent impurities of the commercial sulphur, is sulphuret of arsenic, and that the bisulphuret of mercury sometimes contains sulphuret of arsenic. The sulphur in its pure state, or the mercury in the form of the bisulphuret, could not produce such symptoms as I have described; when mercury is absorbed into the system the salivary glands would be excited to increased action, and the

breath of the patient would have the characteristic odour of ptialism, but the effects produced in the mouth, tongue, and glands in these two cases, are what we might expect when arsenic is absorbed into the system.

I intended before introducing this subject to your notice, obtaining analyses of the various rubbers now offered for our use, and endeavour to ascertain what, in all probability, produced the symptoms observed.

In reference to the specimens presented to our notice to night, I conceive that the absorbents of the mouth would much more readily imbibe any impurity of the rubber in its softened state, that when fully vulcanised, my own experience will induce me to hesitate in using the rubber in that condition, for fear of having even more unpleasant results than those I have already met with.

If any similar cases have come under the notice of any member present, I hope they will detail such cases for our mutual benefit and instruction.

THE PRESIDENT.—I confess I have never seen so extreme a case as that which you have mentioned, but I have seen one or two cases where the mouth was in a very miserable plight from wearing vulcanite. On removing the vulcanite, the symptoms ceased, and on replacing it, they recurred almost immediately. Consequently there can be no doubt in the cases I allude to, that the effect was produced by the vulcanite.

MR. DREW.—I have had several cases of this sort in which ulcer has resulted from the use of vulcanite. I have attributed it generally to its not being sufficiently polished underneath. I afterwards thoroughly rubbed it up with some cloth or linen, so as to produce a delicate polish, and the ulcers ceased after being touched with nitrate of silver.

MR. SPENCE BATE.—I should like to know, sir, whether there was any soreness of throat in the cases just detailed, because I believe that if arsenic is taken into the system the first symptom of its absorption would be a sore throat. If it be not so, I see nothing in the first speaker's case, or this, that could not have arisen from mere mechanical irritation.

THE PRESIDENT.—In the first case there was soreness of throat; but then the patient had been subject to bronchial irritation, and I cannot say, therefore,

whether the soreness of throat was constitutional, or produced by the action of the vulcanite. In the other case there was also irritation in the throat.

Mr. WALKER.—In the second case I reported, dryness of the throat was the first symptom, on seeing the patient two days after placing the vulcanite upper into the mouth she complained of a feeling of dryness of the mouth, and stated she had never passed a more uncomfortable night.

Mr. SPENCE BATE.—It appears to me, sir, that before we can condemn the vulcanite for what it contained, we ought to have good ground for believing that the results mentioned in these cases, are of such a character as to have arisen from arsenic being dissolved in the mouth. The symptoms complained of exhibited themselves so speedily that they appear to me not necessarily to have arisen from any injurious properties contained in the vulcanite, and without some such proofs we ought not to give up the use of what in many cases is a valuable material in dentistry. I am inclined to believe that this soft rubber will be found to be rather a disadvantage than a *desideratum*, since we all know that friction of soft rubber upon the flesh galls more severely than harder substances. We may see some evidence of its power by our india-rubber goloshes wearing out our shoes so quickly. My own impression, therefore, is that the symptoms complained of in the cases cited, are more likely to have arisen from local irritation than from the effects of arsenic being absorbed into the system.

Mr. WALKER.—The inconvenience may certainly have arisen at first from the introduction of a large artificial upper case with undue pressure at points, but when I remember that one symptom succeeded another, and continued, I am still unconvinced by Mr. Spence Bate's remarks, that those symptoms arose from friction and undue pressure.

Again our experience is at variance with the supposition of such symptoms arising from the wearing of an upper piece.

The pustules on the tongue and lower lip could not be produced by the friction or pressure of the vulcanite.

I examined the fit of each carefully, and removed from the lower any part that might induce tenderness, not only once or twice, but several times, did these symptoms appear and disappear on the alternate introduction of, and removal of the teeth.

I could not have been misled as the patient was under my care many weeks, and was obliged to come to the conclusion that the symptoms were produced by the vulcanite. I am not wishing to condemn the use of the vulcanite, but when such symptoms are clearly shown to arise from its wear, I think it behoves us to ascertain what ingredients in the rubber produce them, and as they are similar to the effect produced by the absorption of arsenic, and as sulphur frequently contains arsenic, I think we ought to be most careful that the sulphur used should be perfectly pure.

Mr. CATTLIN.—I have not seen any case of arsenical poisoning similar to that described by Mr. Walker, but I certainly have occasionally seen, under its use, inflammation and ulceration of the gums, which have been caused by the *local action* of an acrid irritant of some kind. I do not believe the lesions I have spoken of were produced by mechanical means, and I am satisfied that many gentlemen in this room must have noticed a distinguishing difference between the ulcers produced by vulcanite and those occasioned by the friction or pressure of gold plates.

Mr. TRUMAN.—Since our last meeting, at the suggestion contained in Mr. Tomes's interesting paper, I have made a few experiments upon stopping, and I have thought it right to bring them before you to-night, though as yet I have arrived at no satisfactory conclusion—my results being almost entirely confirmatory, I may say at once, of Mr. Tomes's views. I think, perhaps, there are one or two points developed by them that may be useful to others engaged in making similar experiments. Mr. Tomes said that it was extremely difficult to find an amalgam stopping with which we could get an exact counterpart of the bottom of the cavity. I have tried a great many experiments to get the exact counterpart of the base of the cavity, and in all, I may say, without a perfect result; but as far as I can see, the sides or walls of the cavity, can be almost completely covered. I have brought the specimens to show you. In this superior molar the cavity was freed from decay, and the fangs were all drilled through from the central cavity to their apex—thus forming one irregular and most difficult arrangement to begin with. The stopping is put in, in the ordinary way, with no more care than we should use in the head. The plugging has passed through two of the

fangs, and almost through the third; and you will find that where I have cut into the roots to examine the state of things at the most uncertain point, in every one of the fangs, the stopping appears to be in perfect contact with the wall at all points. Here, sir, is another specimen where the wall has been cut with a saw, and still the contact appears to be very well kept. This specimen, sir, is a plug that was put in through an opening smaller than the base of the cavity. The plug was put in in small pieces with the greatest care, and although I could not get the base at all well fitted, I could get the sides of the cavity perfectly close, even below the constriction as is now shown in the section.

MR. TOMES.—Mr. President, will you allow me to inquire whether Mr. Truman, after filling the tooth, divided the fang, in order to expose the condition of the plug?

MR. TRUMAN.—The fangs have been all drilled through, and the amalgam put in in the ordinary way. Here is a section, with a portion of the fang cut away, just to show that the wall of the fang is touched as far as you can see. Now I will tell you the test that it has been put to. I have had it under a half inch focal distance microscope power. I can discover no break whatever in that contact. But there is a specimen going round now, Mr. Tomes, which is a section cut directly out of the centre of an amalgam plug. That section I endeavoured to cut thin for you to see it through transmitted light; and, in that case, however close my wall may be, there is palpable daylight through it. Whether that arises from dislodging the stopping I cannot say, but you know it is excessively difficult to get so thin a section as that.

MR. TOMES.—I should propose to Mr. Truman, that in making these experiments there shall be no cutting, sawing, or polishing of the plugs—and on this ground—that the operation may displace a certain amount of amalgam, or of the material in which it is placed. If a gold plug be tested by sawing it in half, you so completely, with the saw, burnish the gold, and drag it against the sides of the cavity, that the plug, although porous and imperfect, looks comparatively solid.

MR. TRUMAN.—I think you will find that, in cutting amalgam plugs, they are so brittle upon the edges and so fragile, that they break away directly instead of being burnished more closely. It is almost

impossible to cut one and leave the edge close. Allow me, Mr. President, to say another word to you on the subject of stopping. I have spent a little time in trying the effect of age upon Mr. Ash's stopping; and I think I find that the old stopping—the stopping that has been in the house for a long time—any stopping where the mercury has been in contact with the metal for a long time—gives a better ground than one that is new. And I would likewise say that I have here a specimen—a section cut from a piece of gold wire that has been screwed with some force into a piece of ivory—and I find quite as much want of contact with the wall as I have with these stoppings. I used the same ivory that I have used in the specimens that I have showed you. The ivory is very soft, and a piece of screw made of gold would form a tap for itself, very solid and close fitting. You would imagine it was as close a thing as you could get in the way of packing, but it is not a bit closer than the filling; and therefore it seems to me that it is a question for us to determine what amount of contact is necessary before we can assure ourselves that our amalgam stoppings fail from the want of contact. I think it would be well if I might suggest to Mr. Tomes, as he is a very good hand at gold stopping, that he should make some experiments upon gold stoppings for the purpose of contrasting them. One word more, sir. Mr. Harrison suggested a gold amalgam at the last meeting, and I asked him some questions. I have fully verified everything Mr. Harrison says upon the subject of this gold amalgam. It does make a most admirable amalgam; but when it is submitted to the action of acids, either muriatic or nitric, it has no preservative effect whatever. The stopping is entirely destroyed by the action of these acids on the mercury. I would ask Mr. Harrison whether he ever tried this experiment?

MR. HARRISON.—In reply to Mr. Truman's question, I beg to say, sir, that I never subjected this amalgam, or any other, to the influence of the acids he has named, but that I conceive that the effect he speaks of would be produced on any amalgam subjected to the action of those acids, and that I did not speak of this amalgam as being calculated to resist acids of that sort. I spoke only of its preservative effects on the teeth, as used in the mouth; and, so far as my experience of it went, of

its not discolouring the teeth. With regard to the effects of nitric and muriatic acid upon it, they are, I think, only what might have been anticipated, as the probable effects of such acids upon any amalgam. To test an amalgam with nitric or muriatic acid, is to subject it to a test that no amalgam was ever intended to resist; and I conceive, moreover, that it is of very little moment that it should—for, if a tooth stopped with a gold plug, even, were subjected to the action of these acids, the tooth itself would be dissolved away from the gold, although the gold would not be injured by them. I think, therefore, sir, that to say that this amalgam will not stand the test of nitric or muriatic acid, is, after all, to say nothing injurious to its good qualities. If it were found that this amalgam would be robbed of its mercury by the acids generated in the mouth, or by any acid which another amalgam would not suffer the same effect from, that would constitute a great objection to it; but I do not believe that this will be found to be the case.

Mr. TRUMAN.—My object in mentioning this characteristic was not to suggest that the stopping was worse than others for it; for I believe that the test I put it to would have destroyed any amalgam stopping. I thought it would be a matter worthy the attention of the Society, that the experiment had been tried, because our reason for using gold in any stopping has been, I presume, that it makes a plug more durable than when less durable metals are used. Therefore, I have said that even where gold is used in the large quantities suggested by Mr. Harrison in this amalgam, still the plug is broken up by contact with these acids, and is injured. Although I must say that, on looking over a large quantity of gold stoppings, and examining the edges of those stoppings, I cannot find any apparent corrosion of the edge of the stopping. It does not seem to me that the acids of the mouth have in any way broken down the edge of the plugs. But that is merely the result of a very small amount of experiment or investigation, and of course this is a subject in the research of which we must go on for many months—not one month, but many.

Mr. HARRISON.—With reference to what has fallen from Mr. Truman and Mr. Tomes as to the impossibility of making amalgams fit closely to the bottoms and sides of the cavities on which

they have been tried, that, I think, may be accounted for by the supposition (which, I believe, is generally received) that these amalgams harden by a process of crystallization. If they do, it follows that, in the formation of those crystals, a certain portion of the amalgam must be separated from the sides and bottoms of the cavities. Such crystals, whatever may be their particular shape, will be so formed that they will dovetail (if I may be allowed the expression) one into the other, so far as the mass of the stopping goes; but as to their perfect adaptation to the sides or bottoms of the cavities, this could not be. On the contrary, it *must* be, if they are crystals, that they do not form in close contact with the sides of the cavity. The crystal, by a law of nature, is formed in its perfect shape, whatever its shape may be, and must necessarily, therefore, only adapt itself imperfectly to the sides of the cavity. The practical question however is, I think, sir, whether these amalgams do not adapt themselves sufficiently closely to the sides of cavities to preserve the teeth from the ingress of the fluids of the mouth, particles of food, &c., as effectually as other stoppings do—and, while on this subject, I should like to ask Mr. Tomes, or any other gentleman who may have been in the habit of subjecting gold stoppings to the microscope, whether or not they find gold stoppings, as a general rule, and as ordinarily introduced, closer in their texture, and closer in their approximation to the sides of the cavities stopped, than these amalgam stoppings are.

Mr. TOMES.—In answer to Mr. Harrison's question with regard to gold stoppings, I may say it is excessively difficult to produce gold stoppings which shall appear under a glass quite perfect; but although we cannot obtain an absolute and uninterrupted contact over the whole surface of the cavity, the gold will be in contact at most points—the separation, when present, being limited to a very small space. With the amalgam stopping you will find that when a want of contact exists, the separation will extend uninterruptedly over a large surface.

With gold you are also enabled, by burnishing, to produce absolute contact at the margin of the cavity. By employing slides in the manner I showed the Society last meeting, you will find that the contact in a gold plug is superior to that attained in an amalgam. It is superior on this account, that the want of contact extends,

when present, in the case of gold, over a very small surface. As regards the presence of crystallization to which I believe is usually attributed the hardening of amalgam, some explanation is required. I have never seen anything like a crystal upon the surface of a hardened amalgam. The mass in solidifying assumes a rough surface produced by a series of individual nodules, which are rounded, and quite destitute of the angular character of crystals. It possibly may be a process of crystallization, but I have never seen anything like a definite form of crystal, nor have I seen anything like an angular process in connexion with the little nodules that form the surface, even where the process of hardening has been undisturbed by contact.

Mr. TRUMAN.—Mr. Tomes speaks of our not having been able to find the crystalline form yet, as far as this stopping is concerned. However, in the last edition of Ure's Dictionary of the Arts, they give an amalgam of tin, which forms a distinct crystalline surface. I meant to have prepared an experiment of that kind to show it to you, but have not had time.

Mr. CATTLIN.—Mr. President, I wish to call the attention of the Society to a case of retarded dentition in a boy, aged fourteen years and nine months. The whole of the temporary set (ten in number) are now firmly fixed in the lower jaw. Two central incisors of the permanent set have just passed through the gum, behind the temporary teeth. They, with the first and second molars on each side, are the only teeth of the permanent set which have, up to this time, been cut in the inferior maxilla. Second dentition has, however, progressed in the usual way in the upper jaw, and all the permanent teeth (except two canine) have been cut at regular periods. I am informed by the mother that this patient has always enjoyed good health, and that he did not cut any tooth of the temporary set until he was thirteen months old.

[The boy was introduced, and examined by the members.]

Mr. Cattlin then exhibited the model of a case of retarded second dentition in the upper jaw, by which it appeared that the incisor teeth had not been cut at the age of ten years and six months. Models of supernumerary teeth in the upper and lower jaws were also exhibited.

Mr. COLEMAN.—I have a short case

to report, sir, which I think may be of interest to the Society. A female, aged twenty-seven, a domestic servant, was sent to me about two months ago, by her master, suffering pain in one of her teeth. She stated that she had a very great objection to have the tooth extracted for reasons I should see when she opened her mouth. When she did so, I found she was suffering pain in the second molar tooth of the upper jaw on the right side, which was decayed on the masticating surface. The first molar tooth had been removed, and there was a large space where it had been leading into the antrum. The patient stated that about four years ago she had the first molar tooth removed. After the operation she suffered considerable pain, accompanied by discharge, portions of dead bone came away, and finally there was this opening left. The discharge continued for some time, and a large substance she described as having the appearance of a piece of leather presented itself at this opening. She began to pull it out, but was afraid to do so when she saw its size, and so she pushed it back again. It was, I have no doubt, the lining membrane of the antrum, which had sloughed. I treated the painful tooth with a strong solution of tannin in ether, and afterwards with a temporary stopping of gutta percha, and finally with a permanent filling. In remedying the defect which existed in her mouth on account of the opening into the antrum, two methods were applicable—one by applying a false tooth and a plate, and the other by a plastic operation. The advantage of the former would be that of not disturbing the mouth, which now appeared to be healthy, in a patient apparently strumous. The other plan presented the advantage of closing the opening perfectly, and preventing at any time small particles of food getting into the antrum; also, if it failed, the former might still be adopted.

Having decided upon the latter method, I pared the edges of the opening, removing as small a portion of the mucous membrane as I could. I should state that I had previously carefully examined the antrum with a probe, and found there was no evidence of dead bone existing there; there had been no discharge for some time. With a fine bistoury, I separated the gum very freely from the outer surface of the jaw, and also from the palate, so as to leave the two flaps as free as possible. By means of two silver-wire sutures, I was

enabled to bring them nearly in contact ; I could not quite do so, as the sutures would certainly have ulcerated out. I removed them in forty-eight hours when I found the hole closed up, with the exception of a very small opening. The next day the patient went into the country, and has only just returned. The opening is now a very minute one, and I have no doubt that one or two applications of the solid nitrate of silver will produce a granulating surface, and quite fill this up.

The following paper from Mr. Belisario, of Sidney (a corresponding member of the Society), was then read :

Mr. President and Gentlemen,—In the December number of the 'British Journal of Dental Science' I perceive the attention of the Society has been actively directed to the treatment of diseases of the dental pulp, and as the subject is highly interesting to us all, and a large, unexplored field to work upon, I propose in the present short paper to lay before you my practice in filling when the pulp is irritable, or merely covered by a layer of disorganized dentine, and which I have practised for the last six years with a very large amount of success. I am aware there is nothing novel in the treatment I am about to lay before you, it having originated with Dr. Dwinelle and Prof. Arthur, and that it may be the practice of many other gentlemen ; but when our aim is to advance the general good of the profession it can only be accomplished by freely communicating our different experiences.

A patient comes to us, complaining of his tooth—he has had a sort of grumbling in it, not exactly toothache—he gets pain on taking sweets or acids, and cannot take comfortably anything above or below the temperature of the body in his mouth, in fact, he has all the symptoms of irritability of the pulp. This is the class of cases that is oftener presented to our notice than those of suppuration of the pulp. This state of the organ being brought on from change of temperature, acidity, and fluids filtering through the partially decalcified tissue. In short, when, in the course of excavating a carious cavity, preparatory to filling, if I proceeded to remove all the disorganized tissue over the pulp, and by so doing would expose it in the slightest degree, I invariably allow it to remain, I do not mind however softened or decomposed state it may be in ; the practice of Drs. Dwinelle and Arthur, in such

cases, was to cap the pulp with gold, and fill over in the ordinary manner. In my hands it has not been so successful, unless coupled with risodontrypy at the time of the operation. If my patients are in town, and I have opportunities of seeing them, I employ the following means: should the dentine over the pulp be in a softened and decalcified state, with tenderness on pressure, I have employed the following remedy, with marked advantage,—the application on cotton wool of Tinct. Ferri, Mur., sealing it in, and renewing it for two or three days, and have generally found, on examination, that the tenderness had subsided, or in a great measure so. I then proceed to fill the tooth, keeping it very free from moisture, with a preparation of gutta percha and tannin worked up together, and dismiss my patient for six weeks. The advantages of this plan are, if active symptoms should supervene the filling can be easily removed and the case treated, though in a very small number of cases it has been necessary to do so. If, at the expiration of the time appointed, I still find tenderness, I refill again in the same manner. I have seldom had occasion to repeat the filling more than twice, for it will generally be found that, under ordinary circumstances, in from six weeks to three months that the disorganized tissue has become hardened, from a deposition of the salts of lime. I think this mode of treatment will afford us, in favorable cases, some data as to the time calcification usually takes place.

I quote one illustration of a well-marked case of the sort, that occurred in January, 1860. The lady of one of our judges consulted me respecting a right upper molar diseased in the masticating surface ; she had suffered one or two twinges of pain and uneasiness on taking hot or cold fluids, sweets, &c. I removed all the carious portion, except that immediately over the pulp, which was much softened, and prepared the walls thoroughly ; there was some tenderness on pressure. I filled the tooth ; the lady called on me two days afterwards, she had slight pain, and was fearful it might increase. I removed the filling and applied the muriated tincture of iron, and allowed it to remain for two days, then refilled, and dismissed her for three months ; she returned on May 2nd, had been quite free from pain during that period ; the filling was slightly worn from mastication, otherwise in good preservation. On careful examination there was

not the least tenderness, the disorganized tissue had become perfectly hardened, and was of a lightish-brown colour. I placed a non-conductor of asbestos at the bottom of the cavity, and filled permanently with crystal gold. One year has now elapsed, and I see my patient frequently; she has been perfectly free from any pain, and the tooth is thoroughly useful and comfortable. I could give many similar cases were it necessary.

While I am on diseases of the pulp, it may not be out of place to give you particulars of a most interesting but decided case of failure, and which resulted from extreme irritability of the pulp, brought on through transmission of temperature, and which I really could not have foreseen. A gentleman, *æt.* 33, requested me to fill two right upper molars, and one on the left, also a right lower molar; they were all SLIGHTLY diseased on the masticating surface, I filled them in two sittings; there was nothing that called for any special attention in this case. I drilled out the diseased matter, which was very slight, and filled. I must here observe, that the cavity in each was so small that I never for one moment thought of applying a non-conductor; in fact, there would have been hardly room for the filling had I done so. He returned to me three weeks afterwards—had been suffering intermittent pain in his head, neck, and ear. I made a careful examination of the filled teeth; there was no difference of sensation under percussion from the others, no pain on taking hot or cold fluids. He said he did not think it originated from the filled teeth. I applied a strong counter-irritant to the gum opposite the teeth, and prescribed a brisk aperient; I saw him again in a week, in consultation with his medical attendant. He had been something better for a day or two, but I suspect it was only while the mind was diverted by the remedies. I again made a most careful examination, and could detect nothing by manipulation or questioning which would warrant me in removing the fillings. It was the opinion of his medical attendant that he was suffering from neuralgia, and he left me, to be treated for it. I did not see him again for six weeks; he had been very unwell, and had been taking constitutional remedies, combined with change of air. He now directed my attention to a swelling over the filled teeth, it had come about a fortnight before I saw him, since then all pain

had ceased. The cause of all the mischief was at length apparent—an abscess over each tooth in the upper jaw. The pulps of the filled teeth must have been exceedingly irritable, and have proceeded to supuration, without any of the usual symptoms of general inflammation of the organ, the filling being no doubt the exciting cause, by transmitting changes of temperature. I felt strongly inclined to remove the dead pulps and fill the fangs, but, on mature consideration, I thought it would be wiser, as he had already suffered so much, to extract the teeth, which I did. I may remark, that I removed the filling in the lower molar, inserted a non-conductor, and refilled. Some months have now gone by, and he has been perfectly free from all inconvenience. I must again reiterate, that there was such a depth of bone over the pulps that no one would have thought of applying a non-conductor; the pains which he described in the head and ear were evidently sympathetic. This patient was of a very excitable and irritable temperament. Failures are often more interesting than successful cases; this is a most unique one.

JOHN BELIBARIO, D.D.S.

The PRESIDENT.—This is a very interesting communication, and I hope we shall not pass it by without comment. There are gentlemen here who can give us the result of their experience upon these matters.

Mr. SPENCE BATE.—I should like to ask, sir, how far in your experience in such cases the use of hydrochlorate of iron can be considered a good practice. The author says it is used with the view of inducing the pulp to throw out lime to refill the semi-decayed tissue over the pulp—that organ not being exposed. It appears to me that this preparation must act either as an astringent or as an acid, and that neither as the one nor as the other can it add to the deposition of lime. The use of a material for this purpose, which either acts as an acid or as an astringent, or both, seems to be, at first sight, not quite good practice. I do not know how it can act as the author supposes; but perhaps other persons can explain it.

Mr. HARRISON (after a pause).—I think, Mr. President, that the question put to the Society by Mr. Spence Bate is one of very great practical importance, and I have only been thus slow in rising to speak upon it, because I had hoped

that other gentlemen would have done so. I confess I was struck, as Mr. Bate seems to have been, with regard to the point alluded to by him, on hearing Mr. Belisario's paper read. The muriated tincture of iron is a preparation which I certainly should not have *chosen* to apply to softened dentine, over an irritable pulp, unless my object had been to destroy the pulp. We all of us know that muriated tincture of iron contains an excess of acid, and acts as acid upon the teeth. How, therefore, such a preparation can act in soothing an irritable pulp, and in exciting such an action in it as would set up calcification, I am at a loss to understand. It is always a matter to be regretted, when discussing a paper, if the author cannot be present to defend it, and to answer any question that may be put to him respecting it—as our discussions, under such circumstances, must, to a certain extent, be speculative. Were Mr. Belisario here, I should have asked him whether, when he completed the treatment of this tooth, and finally stopped it, it presented the appearance of a living or dead tooth. In the absence of positive information upon that point, any opinion we may any of us give on the treatment recommended must be, as I have just said, speculative; but I should conceive, that the application of muriated tincture of iron to softened dentine, over an irritable pulp, would, in all probability, have the effect of setting up suppurative action, and in that way destroy the pulp—although the tooth might be ultimately saved by it. I should be glad, sir, to hear the opinion of other members of the society on this point, as I think it one of great practical importance, and consider the question raised by Mr. Spence Bate one that should not be allowed to drop without comment.

Mr. COLEMAN.—I am inclined to believe that the treatment of the exposed pulp by the means recommended by Mr. Belisario may be a very useful one. Having employed, I think I may say with considerable success, a very strong solution of tannin in ether, it is my opinion that the action of the muriated tincture of iron would, as it is also a powerful astringent, be very similar, the action of both these substances on albuminous compounds is to coagulate them.

A short time since, when I had the honour of introducing to the notice of the Society the results of cases treated with a very strong solution of tannin, I advanced

a theory that the action of this agent was to form an insoluble compound with the decalcified dentine, a substance resembling leather, and thus to protect the pulp which underwent calcification, and I believe the action of the tincture of perchloride of iron would be somewhat similar. It is a substance I have often thought of employing, but have never done so.

Mr. HARRISON.—In reference to what has fallen from Mr. Coleman as to the coagulation of the blood produced by the muriated tincture of iron, applied topically, I beg to remind him that, in producing this effect, we always destroy, to a certain extent, the surface to which it is applied, by setting up after-suppurative; and that, I conceive, would be the effect of the application of this tincture to the softened dentine, in the manner mentioned. I would ask Mr. Coleman, too, when he speaks of the astringent qualities of this tincture producing the same effect as tannin dissolved in ether, in the way he has recommended, what becomes of the free muriatic acid contained in it. That there is an excess of free muriatic acid in the muriated tincture of iron, we all know—and what, I would ask, would be the probable effect of it? Even admitting that the astringent quality of this tincture might produce the effect which he supposes—and so protect the pulp, and allow of its taking on calcification—I conceive that the free muriatic acid of which I have spoken must be injurious to the sides of the cavity, previously prepared as described. I may add, sir, that I have the highest possible opinion of the solution of tannin in ether, recommended by Mr. Coleman in the treatment of these cases; but that I conceive the effects of these two preparations would be anything but alike in their action upon the teeth. Such, at any rate, would be my impression, arguing theoretically upon the subject—although, of course, all purely theoretical views must give way, if opposed by facts.

Mr. COLEMAN.—Remembering, as we all must, the injurious effects of the perchloride of iron on the teeth when administered internally, we might naturally suppose that its action on an exposed pulp would be very similar to that it exercises upon the external surfaces of these organs. But I imagine the effect of this substance on decalcified dentine, and an exposed pulp, as also that of tannin, is very similar to the action of both these substances upon the blood, namely, in rendering its albumen

insoluble. Both these substances are given internally, as we all know, with the view of making the blood coagulate more readily. Of course the existence of a free acid might lead to the belief that the application would prove more injurious than beneficial, but the action of the salt on the decomposed dentine and pulp may result in the formation of a substance not capable of being acted on by the acid. The best proofs, I think, of the acid doing no injury are the successful results of the gentleman who has favoured us with the paper.

Mr. T. A. ROGERS.—In reference to the second case mentioned by Mr. Belisario, there might, I think, have been this cause for the abscesses formed at the roots of the teeth. He does not mention whether he made a "post-mortem" examination of the teeth; but many of us have, doubtless, met with little irregular processes extending from the pulp, which give rise to great annoyance in filling the teeth, and the irritation from touching which might very probably lead to inflammation at the root of the tooth.

The PRESIDENT.—At this meeting, gentlemen, it is our usual custom to appoint two auditors to audit the accounts of our Treasurer. According to our laws, we have the power of doing so by taking the

opinion of the Society by ballot, or by the nomination of two by the President. If any members of the Society present are desirous of taking the opinion by ballot, I shall be most happy to do so; but if, on the contrary, they have no objection to my nominating two gentlemen, I shall be happy to act in that way. It is necessary that we should do this previously to our next Annual General Meeting. (After a pause)—Is it your opinion, gentlemen, that we should ballot for our auditors? (There being no reply, the President then said)—If it is not your intention to proceed to the ballot, I will name Mr. Owen and Mr. Harrison as auditors of our Treasurer's accounts. If these gentlemen will kindly undertake the office, I think it would be a satisfactory arrangement.

It now only remains for me to return our thanks to those gentlemen who have contributed the specimens, and to Mr. Belisario for his paper. I regret he is not here to furnish us with other details, and that no one is here who can answer for him. I think papers, which are read in the absence of the writer, are unsatisfactory in certain respects; but it is a great kindness in gentlemen living at such a distance to send us papers at all. We now adjourn.

The Month: Miscellaneous and Scientific Intelligence.

A NEW SUBSTITUTE FOR IVORY, HORN, &c.

THE collodion film, when formed on glass, is tough, and can be made of any desired thickness; and by the addition of gutta percha, india rubber, &c., a great range of elasticity, pliability, and hardness, it is said, may be produced. It has recently been proposed to apply these sheets of dried collodion (which, if made of good pyroxyline, will be colourless and transparent) to several useful purposes. Out of a mass of it, with proper tools, it is easy to work any desired form. The dried collodion is said to possess the physical properties of many

of the most valuable materials used in the arts; it may be substituted for ivory, horn, wood, glass, &c., for the manufacture of statuary, billiard-balls, buttons, &c.

CHLORATE OF POTASH FOR FETID BREATH.

(From the *Med. Times and Gazette*,
Aug. 24th, 1861.)

MANY persons suffer from fetid breath, without this being attributable to the presence of bad teeth or the want of attention to the mouth, the gums and mucous

membrane being also quite healthy. The smell may proceed from the lungs or the stomach, but in nine cases out of ten it originates in the stomach, and the following is then a simple and prompt remedy:—Three hours after a meal take a large teaspoonful of a solution of six parts of chlorate of potash in 120 parts of sugared water, and at the same time rinse out the mouth well with the same solution.—*Bulletin de Thérapeut.*, vol. lxi, p. 73.

PHYSIOLOGICAL EFFECTS OF CHLOROFORM.

(From 'The Encyclopædia Britannica.')

IN an able article on chloroform, Professor Simpson describes its physiological effects as follows:

"After a few inhalations, a feeling of warmth and exhilaration supervenes, radiating from the head towards the extremities. In most persons this is followed by a numbness and thrilling throughout the body, by whining noises in the ears, and brilliant lights before the eyes. After one or two additional inhalations there is a loss of voluntary motion and of sensation, and at length a complete suspension of consciousness. During this anæsthetic sleep the relation between the mental condition of the patient and his susceptibility to pain depends partly on the constitution of the individual himself and partly on the amount of the dose administered. When the full dose is given, mental action is not remembered, though it occasionally goes on, and the muscles are perfectly relaxed. Sometimes, before this total relaxation, there is violent spasmodic action, especially if the patient is restrained. The pulse beats with increased rapidity during the first ten exhalations, but when the system is fully brought under the effect of the anæsthetic it becomes slower than is natural. The respiration gets slower and deeper as the chloroform is being inhaled, and is usually rendered soporose before any great surgical operation is begun. The temperature of the body decreases when the action of the chloroform is long continued."

The means the professor advises for bringing about recovery when overdoses are given are the following:

"The removal of everything containing the chloroform from the neighbourhood of

the patient, the supine position, and free access of pure air to his face, with the performance of artificial respiration, where necessary, by alternate compression and relaxation of the walls of the chest, the tongue having been pulled forward if it has fallen backwards on the top of the wind-pipe."

Dr. Humphry once saved a patient, when the peculiar change that precedes the approach of death was actually passing over his countenance, by wheeling the chair in which he was reclining so as to place the soles of his feet close to a large fire.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE following gentleman, having undergone the necessary examinations for the diploma, was admitted a Member of the College at a meeting of the Court of Examiners on the 14th ultimo:—Edwin John Winterbottom, L.D.S.R.C.S., Sloane Street.

OBITUARY.

WE regret to have to announce the sudden death of Mr. Albert Edward Olive, L.D.S.R.C.S., of 47, Smith Street, Chelsea, from hæmorrhage on the lungs.

He was among the earliest of those who obtained the diploma of Dental Surgery of the Royal College of Surgeons, his name appearing twenty-second on the list at the second meeting of the Board of Examiners, held March 14th, 1860. He was elected a member of the Odontological Society, May 4th, 1857, and took a deep interest in its proceedings, although the precarious state of his health, suffering as he was from a pulmonary complaint, prevented his attendance at the meetings for some time past. His amiability and gentleness endeared him to all who knew him, and his loss will be regretted by a large circle of friends and patients. Mr. Olive was in his thirty-seventh year, and has left a widow and four children to lament his untimely death.

We extract the following from a local paper :

"CHESTER GENERAL INFIRMARY.

"Hepdomadal Board, Nov. 5th, 1861.

"A letter having been received from JOSEPH SNAPE, Esq., resigning his appointment as Dental Surgeon to the Institution, in consequence of change of residence,

"The Board, in accepting the resignation of Mr. SNAPE, as Honorary Surgeon Dentist to the Institution, while expressing their great regret at the loss of his valuable services, desire to record the high estimation in which he is held by all the Medical Officers and Governors of the Institution, for the kind and efficient manner in which he has invariably discharged his duties, and to offer him their best thanks for the same.

"JOHN ROGERS, Chairman."

To Correspondents.

NOTICE.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Office, 11, New Burlington Street, London, W., BEFORE THE FIFTH day of the month, and duly authenticated by the name and address of the writer.
2. All communications relative to subscriptions and advertisements are to be addressed to the Publisher, Mr. John Churchill, 11, New Burlington Street, London, W.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. The Journal will be supplied direct from the Office on PREPAYMENT of subscriptions as under :

Twelve Months (post-free)	13s. 0d.
Six Months	6s. 6d.

 Post-office Orders to be made payable, at the Regent Street Office, to John Churchill, 11, New Burlington Street, W. A single number sent on receipt of thirteen stamps.

"Mr. Ransom."—Your communication shall appear in our next. It was unfortunately much too late for this number.

Mr. Bartlett's notes have not been received.

Mr. Drew's corrections were returned too late.

"Mr. W. Duncan."—See Notice.

Communications have been received from Dr. J. L. Levison; Messrs. Geo. Owen; Balkwill; O. A. Fox; W. Duncan; and Rutterford.

[ADVERTISEMENT.]

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